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FIELD EXPERIMENTS WITH SUGAR CANE, XV.

THE VARIETY AND FERTILIZER POSITION OF THE SUGAR INDUSTRY, XII.

REPORT ON THE SUGAR EXPERIMENT STATIONS FOR THE YEAR 1946.

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SUGAR EXPERIMENT STATIONS.

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FIELD EXPERIMENTS WITH SUGAR CANE, XV.

BY

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W. H. C. KNOWLES, *Sugar Agronomist,*

AND

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INTRODUCTION.

In addition to the results of 46 variety and 8 manurial trials this paper also includes for the first time, the results of 10 cultivation trials. All experiments have been designed to permit of statistical treatment of the results.

Table I shows that the total rainfall experienced at Sophia for 1946 was 15.10 inches below the average. However, the total rainfall was quite well distributed—fairly heavy rains in February, April and May tending to alleviate the spring dry season whilst with the exception of a very dry December, the autumn dry season cannot be considered unusually severe. On the whole, the year was a good one for cane and high yields were obtained from the majority of experiments.

TABLE I.—**Comparison of January–December Rainfall at Sophia Sugar Experiment Station for 1946 with the Average for 1921-1946.**

Month.	Actual Rainfall, 1946. Inches.	Average Rainfall, 1921—1946, Inches.	Excess or Deficit, Inches.
January 1946	4.53	8.60	— 4.07
February „	5.71	4.66	1.05
March „	1.31	4.55	— 3.24
April „	10.11	6.34	3.77
May „	15.02	11.99	3.03
June „	9.84	14.71	— 4.87
July „	17.73	11.63	6.10
August „	5.00	7.64	— 2.64
September „	1.37	2.58	— 1.21
October „	1.86	3.84	— 1.98
November „	5.53	5.69	— 0.16
December „	3.35	14.23	—10.88
Total	81.36	96.46	—15.10

VARIETY TRIALS.

The variety trials are detailed under four sub-sections, *viz.* :—

(a) Plant cane variety trials;

(b) First ratoon variety trials;

(c) Second ratoon variety trials;

(d) Discussion and summary.

SUB-SECTION A.—PLANT CANE VARIETY TRIALS.

Plant Cane Variety Trials Reaped at Sophia Sugar Experiment Station.

The data obtained from these trials is presented in Table II. With the exception of the trial in Field 4 W. all were reaped during the spring crop and the yields as judged by those of the standard (P.O.J. 2878), were very satisfactory throughout. The trials were devoted entirely to testing the 1941 seedling series against P.O.J. 2878, except in 4 West, where Co. 421 was included as an additional check.

It is, of course, too early to draw any conclusions about the possible merits of the 1941 seedlings, but it will be seen that many have yielded significantly more sugar/acre than P.O.J. 2878 in their first year of trial and in some instances this is accompanied by juice of superior quality. They may be looked upon, on the whole, as promising.

TABLE II.—Results of Plant Cane Variety Trials Reaped at Sophia Sugar Experiment Station.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre.	
						Tons.	% Mean.
	Sophia,	*Field*	*9 E. "A."*	*Reaped*	*1.v.46*	*at 15.25*	*months.*
MEANS OF 4 PLOTS:	D. 34/41	46.45	15.69	5.73	87.3	7.29	128.57
	D. 27/41	39.36	15.99	4.23	86.9	6.29	110.93
	D. 113/41	43.18	13.66	6.56	87.3	5.90	104.06
	D. 97/41	36.47	16.16	6.08	85.8	5.89	103.88
	D. 145/41	40.25	14.42	5.01	88.7	5.80	102.29
	D. 29/41	40.83	13.90	4.58	88.4	5.67	100.00
	P.O.J. 2878	32.99	16.77	3.80	89.0	5.53	97.53
	D. 136/41	34.84	14.56	6.87	87.1	5.07	89.42
	D. 147/41	33.01	14.67	5.32	87.7	4.84	85.36
	D. 69/41	33.92	13.05	8.02	85.1	4.42	77.95
	Mean:					5.67	100.00
	Significant Difference, 20: 1:					0.81	14.29
	Sophia,	*Field*	*9 E. "B."*	*Reaped*	*25.iv.46*	*at 15.00*	*months.*
MEANS OF 4 PLOTS:	D. 21/41	40.56	14.99	4.23	87.9	6.08	127.20
	D. 20/41	40.79	14.16	3.78	85.4	5.77	120.71
	D. 31/41	36.76	14.56	3.77	87.2	5.35	111.92
	D. 1/41	33.98	14.53	4.59	87.8	4.94	103.35
	D. 75/41	34.26	14.28	4.39	89.4	4.89	102.30
	D. 19/41	33.34	13.71	4.72	88.6	4.57	95.61
	D. 77/41	30.83	14.46	3.78	87.7	4.46	93.31
	P.O.J. 2878	25.92	16.07	9.05	88.3	4.17	87.24
	D. 8/41	27.65	14.63	3.88	88.1	4.04	84.52
	D. 10/41	24.44	14.63	3.57	89.0	3.58	74.90
	Mean:					4.78	100.00
	Significant Difference, 20: 1:					1.25	26.15
	Sophia,	*Field*	*11 E. "A."*	*Reaped*	*13.iv.46*	*at 14.75*	*months.*
MEANS OF 4 PLOTS:	D. 93/41	41.75	15.55	3.01	88.6	6.49	120.19
	D. 156/41	43.56	14.60	4.34	87.5	6.36	117.78
	D. 147/41	41.90	14.43	3.55	86.2	6.04	111.85
	D. 142/41	37.48	15.98	2.57	89.1	5.99	110.93
	P.O.J. 2878	34.43	15.25	4.18	87.0	5.25	97.22
	D. 33/41	40.38	12.75	5.56	83.1	5.15	95.37
	D. 4/41	32.73	15.58	3.82	87.8	5.10	94.44
	D. 91/41	34.23	13.45	4.86	84.8	4.60	85.19
	D. 82/41	33.51	13.59	5.27	83.7	4.55	84.26
	D. 71/41	27.98	14.77	4.76	85.4	4.50	83.33
	Mean:					5.40	100.00
	Significant Difference, 20: 1:					1.10	20.37
	Sophia,	*Field*	*11 E. "B."*	*Reaped*	*10.iv.46*	*at 14.75*	*months.*
MEANS OF 4 PLOTS:	D. 155/41	42.51	13.52	4.29	88.4	5.75	111.65
	D. 35/41	41.05	13.68	4.33	86.7	5.61	108.93
	D. 29/41	39.17	14.23	4.50	86.6	5.57	108.16
	D. 36/41	35.80	15.02	5.27	88.3	5.37	104.27
	D. 34/41	38.12	14.03	8.24	84.7	5.35	103.88
	D. 92/41	39.30	13.19	7.94	83.3	5.18	100.58
	D. 107/41	33.81	14.32	3.98	86.6	4.84	93.98
	D. 129/41	37.92	12.73	4.90	86.7	4.83	93.79
	P.O.J. 2878	29.52	15.76	4.65	88.5	4.65	90.29
	D. 135/41	33.75	13.00	5.13	85.2	4.38	85.05
	Mean:					5.15	100.00
	Significant Difference, 20: 1:					0.73	14.17

TABLE II (Contd.).—**Results of Plant Cane Variety Trials Reaped at Sophia Sugar Experiment Station.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre.	
						Tons.	% Mean.
	Sophia,	*Field*	*4 W.,*	*Reaped*	*11.xii.46*	*at 12.00*	*months.*
MEANS OF 3 PLOTS:	D. 40/41	41.24	13.82	7.85	84.1	5.70	126.39
	D. 27/41	34.82	15.01	6.21	88.9	5.22	115.74
	D. 49/41	35.59	14.37	9.17	87.9	5.12	113.53
	D. 125/41	33.73	14.54	6.18	86.4	4.90	108.65
	Co. 421	36.64	13.30	7.88	87.8	4.87	107.98
	D. 26/41	35.97	13.07	12.52	82.8	4.70	104.21
	D. 31/41	35.09	13.11	7.98	85.3	4.60	102.00
	P.O.J. 2878	32.25	13.63	9.05	84.9	4.39	97.34
	D. 25/41	28.91	12.23	7.87	85.9	3.54	78.49
	D. 112/41	30.64	10.83	10.49	81.3	3.32	73.61
	D. 77/41	25.03	13.03	8.59	83.5	3.26	72.28
	Mean:					4.51	100.00
	Significant Difference, 20: 1:					1.15	25.50
	Sophia,	*Field*	*8 W. "A."*	*Reaped*	*10.iii.46*	*at 14.00*	*months.*
MEANS OF 4 PLOTS:	D. 103/41	48.93	13.11	5.80	90.8	6.41	116.33
	D. 37/41	42.12	14.22	7.37	86.6	5.99	108.71
	D. 62/41	41.74	13.95	5.07	88.9	5.82	105.63
	D. 81/41	36.09	15.48	4.22	89.5	5.59	101.45
	D. 28/41	39.79	13.89	5.70	86.8	5.53	100.36
	D. 38/41	41.27	12.86	13.64	87.3	5.31	96.37
	D. 93/41	38.40	12.25	11.40	84.7	4.71	85.48
	P.O.J. 2878	33.20	14.16	4.01	91.9	4.70	85.30
	Mean:					5.51	100.00
	Significant Difference, 20: 1:					0.85	15.43
	Sophia,	*Field*	*8 W. "B."*	*Reaped*	*2.iii.46*	*at 13.75*	*months.*
MEANS OF 4 PLOTS:	D. 55/41	39.01	13.92	4.45	88.9	5.43	113.84
	D. 26/41	39.63	12.90	21.50	84.2	5.11	107.13
	D. 51/41	39.93	12.44	8.75	87.1	4.97	104.19
	D. 24/41	37.98	13.01	5.58	85.8	4.94	103.56
	D. 46/41	38.27	12.62	5.62	87.1	4.83	101.26
	D. 56/41	39.22	11.81	14.39	84.8	4.63	97.06
	P.O.J. 2878	35.53	12.26	8.06	85.8	4.36	91.40
	D. 60/41	37.97	10.36	11.54	82.4	3.93	82.39
	Mean:					4.77	100.00
	Significant Difference, 20: 1:					—	—
	Sophia,	*Field*	*14 W. "A."*	*Reaped*	*3.iv.46*	*at 13.75*	*months.*
MEANS OF 4 PLOTS:	D. 118/41	41.85	12.83	6.88	85.9	5.37	117.25
	D. 39/41	39.26	13.18	4.57	86.9	5.17	112.88
	D. 84/41	35.55	13.68	6.13	86.2	4.86	106.11
	D. 2/41	36.15	12.91	4.79	88.8	4.66	101.75
	P.O.J. 2878	30.54	15.19	4.91	88.7	4.64	101.31
	D. 79/41	32.60	13.23	5.88	87.8	4.31	94.10
	D. 72/41	30.37	12.84	5.12	88.6	3.90	85.15
	D. 33/41	30.13	12.52	5.86	86.3	3.77	82.31
	Mean:					4.58	100.00
	Significant Difference, 20: 1:					0.88	19.21

TABLE II (Contd.).— **Results of Plant Cane Variety Trials Reaped at Sophia Sugar Experiment Station.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.
	Sophia,	*Field*	*14 W. "B."*	*Reaped*	*3.iv.46*	*at 13.75*	*months.*
MEANS OF 4 PLOTS:	D. 40/41	30.52	14.01	5.99	86.2	5.54	115.66
	D. 44/41	39.77	12.46	6.44	86.6	4.95	103.34
	D. 68/41	36.03	13.50	6.13	86.4	4.86	101.46
	D. 61/41	31.77	14.93	4.57	88.0	4.74	98.96
	D. 54/41	29.59	15.88	3.92	90.0	4.70	98.12
	D. 76/41	34.13	13.45	7.72	86.1	4.59	95.82
	D. 101/41	34.46	12.94	6.75	86.4	4.46	93.11
	P.O.J. 2878	30.52	14.60	7.51	89.4	4.45	92.90
	Mean:					4.79	100.00
	Significant Difference, 20: 1:					—	—
	Sophia,	*Field*	*15 W. "A."*	*Reaped*	*24.iii.46*	*at 12.75*	*months.*
MEANS OF 4 PLOTS:	D. 161/41	50.14	14.19	10.39	85.9	7.11	125.18
	D. 117/41	46.33	14.60	9.45	86.7	6.77	119.19
	D. 112/41	43.74	13.01	9.26	84.1	5.69	100.18
	P.O.J. 2878	36.59	15.37	9.05	85.9	5.62	98.94
	D. 98/41	38.59	13.65	5.67	87.2	5.26	92.61
	D. 127/41	36.06	14.24	8.40	85.3	5.14	90.49
	D. 132/41	38.04	13.40	14.69	81.5	5.10	89.79
	D. 131/41	39.14	12.17	23.06	79.5	4.76	83.80
	Mean:					5.68	100.00
	Significant Difference, 20: 1:					1.03	18.13
	Sophia,	*Field*	*15 W. "B."*	*Reaped*	*20.iii.46*	*at 12.75*	*months.*
MEANS OF 4 PLOTS:	D. 165/41	42.31	15.29	5.94	87.1	6.47	116.16
	D. 178/41	43.30	14.36	4.44	88.2	6.22	111.67
	P.O.J. 2878	36.98	15.88	4.52	89.4	5.87	105.39
	D. 30/41	39.83	14.01	5.45	88.2	5.58	100.18
	D. 174/41	40.94	13.41	6.98	85.3	5.49	98.56
	D. 32/41	42.90	12.56	12.35	81.9	5.39	96.77
	D. 123/41	40.14	13.31	8.96	86.3	5.34	95.87
	D. 90/41	34.60	12.20	8.75	82.5	4.22	75.76
	Mean:					5.57	100.00
	Significant Difference, 20: 1:					—	—

Plant Cane Variety Trials Reaped in Berbice and East Demerara.

Three trials have been harvested from Berbice and three from East Demerara. The results are presented in Table III. Tonnage and quality may be looked upon as satisfactory. It will be noted that:—

i. B.34104 (Co. 281 x B.H. 10/12) heads the list in 3 out of the 4 trials in which it appears. At Rose Hall it is significantly better than D.200/36, D.14/34 and D.14/33, while at Blairmont it has beaten P.O.J. 2878 and D.200/36 by a significant margin. At Providence, Demerara, it appears somewhat immature and has been significantly defeated by D.14/34;

ii. D.14/34 (Co. 281 x Diamond 10) appears in 4 trials and is top in one (Providence, Demerara). Here its performance is outstanding and it has beaten B.34104, B.37193 and P.O.J. 2878 by a significant margin. It is significantly better than P.O.J. 2878 in the Blairmont trial;

iii. D.14/33 (Co. 281 x Diamond 10) appears in three trials. It is significantly better than P.O.J. 2878 in one but significantly worse than the standard at Rose Hall;

iv. D.200/36 (P.O.J. 2878 x Co. 213) appears in four trials. It has twice been significantly outyielded by B.34104, but leads the standard by a significant margin in the Providence trial;

v. D.2/40 (Co. 281 x D.165/30), D.21/40 (Co. 421 x Co. 419) and D.30/40 (Co. 421 x Co. 419) do not differ significantly from the standard in the two trials in which they appear.

TABLE III.— Results of Plant Cane Variety Trials Reaped in Berbice and East Demerara.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.
	Pln. Port Mourant, Field 24 T.L. Reaped 3.v.46 at 14.00 months.						
MEANS OF 5 PLOTS:	B. 34104	41.60	15.25	3.83	91.9	6.34	116.97
	D. 200/36	40.66	14.46	5.82	88.6	5.88	108.49
	D. 25/38	38.55	14.41	5.81	87.8	5.55	102.40
	D. 14/34	34.30	15.18	4.91	90.4	5.21	96.13
	D. 14/33	33.32	15.51	3.88	91.0	5.17	95.39
	P.O.J. 2878	29.24	15.05	6.37	88.4	4.40	81.18
	Mean:					5.42	100.00
	Significant Difference, 20: 1:					—	—
	Pln. Rose Hall, Field 49a A. Reaped 2.iv.46 at 12.50 months.						
MEANS OF 5 PLOTS:	B. 34104	47.62	16.41	3.88	90.8	7.81	111.57
	D. 25/38	48.68	15.47	3.07	89.3	7.53	107.57
	P.O.J. 2878	44.56	15.74	4.02	89.2	7.01	100.14
	D. 200/36	47.94	14.52	3.62	88.5	6.96	99.43
	D. 14/34	43.72	15.86	2.92	90.1	6.94	99.14
	D. 14/33	37.75	15.32	2.90	90.0	5.78	82.57
	Mean:					7.00	100.00
	Significant Difference, 20: 1:					0.80	11.43
	Pln. Blairmont, Field 13 Rp. Reaped 22.ii.46 at 11.50 months.						
MEANS OF 5 PLOTS:	B. 34104	24.86	16.35	2.76	92.2	4.06	112.15
	D. 14/34	24.65	15.84	2.98	91.4	3.91	108.01
	D. 14/33	23.29	16.38	2.93	91.9	3.81	105.25
	D. 25/38	26.15	13.83	3.41	88.7	3.62	100.00
	D. 200/36	22.09	14.45	3.60	87.5	3.19	88.12
	P.O.J. 2878	20.02	15.64	3.26	91.3	3.13	86.46
	Mean:					3.62	100.00
	Significant Difference, 20: 1:					0.56	15.47
	Pln. Enmore, Field 17 H.W. Reaped 17.ix.46 at 14.75 months.						
MEANS OF 5 PLOTS:	D. 21/40	52.67	11.54	13.41	78.6	6.08	109.75
	D. 30/40	42.46	13.43	7.42	85.0	5.70	102.89
	D. 2/40	39.66	13.24	7.80	85.0	5.25	94.77
	P.O.J. 2878	36.67	14.03	7.32	84.4	5.15	92.96
	Mean:					5.54	100.00
	Significant Difference, 20: 1:					—	—
	Pln. Lusignan, Field 9 M.R. Reaped 26.iv.46 at 11.50 months.						
MEANS OF 5 PLOTS:	D. 21/40	62.25	13.67	8.61	84.7	8.51	113.16
	P.O.J. 2878	48.55	15.13	4.85	88.2	7.34	97.61
	D. 2/40	47.08	15.16	6.45	88.7	7.14	94.95
	D. 30/40	54.27	13.06	7.43	84.8	7.09	94.28
	Mean:					7.52	100.00
	Significant Difference, 20: 1:					—	—
	Pln. Providence, Dem., Field 57/8 R.P. Reaped 29.xi.46 at 11.75 months.						
MEANS OF 5 PLOTS:	D. 14/34	32.34	14.61	6.18	87.3	4.72	110.54
	D. 200/36	38.64	11.45	14.64	80.7	4.43	103.75
	B. 34104	30.51	13.59	7.83	87.6	4.15	97.19
	B. 37193	35.26	11.72	11.95	82.2	4.13	96 72
	P.O.J. 2878	31.08	12.66	11.40	84.8	3.93	92.04
	Mean:					4.27	100.00
	Significant Difference, 20: 1:					0.31	7.26

Plant Cane Variety Trials Reaped in West Demerara.

Table IV summarizes the results of three trials. The following points are noteworthy.

i. D. 28/38 (Co. 421 x Diamond 10) and Co. 421 (P.O.J. 2878 x B. 3412) are signficantly better than the standard in both of the trials in which they occur;

ii. D. 2/40 (Co. 281 x D. 165/30) D. 21/40 (Co. 421 x Co. 419) and D. 30/40 (Co. 421 x Co. 419) are all significantly better than the standard in the Wales trial. D. 21/40 and D. 2/40 appear in two further trials but do not differ significantly from P.O.J. 2878 in either;

iii. An outstanding feature of this series of experiments is the very poor performance of B. 34104 and B. 37161. They are significantly lower than P.O.J. 2878 both at Leonora and Uitvlugt. No explanation of their poor showing can be advanced at present.

TABLE IV.—Results of Plant Cane Variety Trials Reaped in West Demerara.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre.	
						Tons.	% Mean.
	Pln.	*Wales,*	*Field 10*	*E.V.L.F.*	*Reaped 20.*	*viii.46 at 15.00 months.*	
MEANS OF 5 PLOTS:	D. 30/40	53.02	12.59	8.93	88.2	6.67	118.05
	D. 21/40	49.70	12.23	12.83	83.5	6.08	107.61
	D. 2/40	43.47	13.54	6.10	89.6	5.88	104.07
	P.O.J. 2878	28.11	14.21	10.20	88.3	3.99	70.62
	Mean:					5.65	100.00
	Significant Difference, 20: 1:					1.54	27.26
	Pln.	*Leonora,*	*Field*	*A. Ed.*	*Reaped 19.*	*ix.46 at 14.00 months.*	
MEANS OF 5 PLOTS:	D. 28/38	47.51	15.71	6.91	91.4	7.46	127.74
	Co. 421	48.95	13.60	6.67	85.3	6.66	114.04
	B. 3337	50.39	12.44	9.95	85.9	6.27	107.36
	D. 21/40	51.39	11.74	15.91	80.2	6.03	103.25
	D. 2/40	44.81	13.14	7.60	85.8	5.89	100.86
	P.O.J. 2878	42.34	13.57	11.39	84.6	5.75	98.46
	B. 37161	34.54	12.99	7.57	85.6	4.49	76.88
	B. 34104	33.56	12.53	9.04	84.9	4.20	71.92
	Mean:					5.84	100.00
	Significant Difference, 20: 1:					0.70	11.99
	Pln.	*Uitvlugt,*	*Field*	*23 M.Z.*	*Reaped 13.*	*viii.46 at 12.75 months.*	
MEANS OF 5 PLOTS:	Co. 421	41.57	11.85	12.88	83.3	4.93	135.81
	D. 28/38	34.16	13.33	5.64	87.3	4.55	125.34
	D. 21/40	36.31	10.33	28.51	78.7	3.75	103.31
	P.O.J. 2878	30.68	11.97	10.22	85.1	3.67	101.10
	B. 3337	33.88	10.81	20.01	79.8	3.66	100.83
	D. 2/40	31.23	11.57	15.06	81.7	3.61	99.45
	B. 37161	22.89	11.60	10.91	83.3	2.66	73.28
	B. 34104	19.13	11.65	15.67	83.8	2.23	61.43
	Mean:					3.63	100.00
	Significant Difference, 20: 1:					0.58	15.98

SUB-SECTION B.—FIRST RATOON VARIETY TRIALS.

First Ratoon Variety Trials Reaped At Sophia Sugar Experiment Station.

Four trials were reaped and the results are summarized in Table V. The yields in every case surpassed those of the plant crop and may be looked upon as satisfactory. We may note that:—

i. Co. 421 maintained the high standard of its returns as plant canes and significantly outyielded P.O.J. 2878 in both of its trials;

ii. B. 37161 (B. 3365 x B. 603) improved upon its plant cane performance and outyielded Co. 421 in its only trial, though not significantly;

iii. D.2/40, D.21/40 and D.40/40 (P.O.J. 2878 x D.552/33) all led P.O.J. 2878 by significant margins in one trial. Both D.2/40 and D.21/40 performed well in other trials;

iv. B.34104 (Co. 281 x B.H. 10/12) improved slightly as ratoons and was no longer significantly outyielded by D.21/40.

TABLE V.—Results of First Ratoon Variety Trials Reaped at Sophia Sugar Experiment Station.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre.		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
	Sophia, Field 2 E. "A." Reaped 28.viii.46 at 12.50 months.								
MEANS OF 4 PLOTS:	D. 2/40	34.85	13.62	7.22	88.2	4.74	107.97	D. 2/40	8.12
	P.O.J. 2878	26.33	15.35	6.45	89.3	4.04	92.03	P.O.J. 2878	6.91
	Mean:					4.39	100.00		
	Significant Difference, 20:1:					—	—		
	Sophia, Field 2 E. "B." Reaped 21.viii.46 at 12.50 months.								
MEANS OF 4 PLOTS:	Co. 331	40.35	12.65	6.35	89.5	5.10	107.59	D. 21/40	9.14
	D. 21/40	43.93	11.45	14.77	83.1	5.03	106.12	Co. 331	8.68
	B. 34104	36.12	13.45	6.08	90.6	4.86	102.53	B. 34104	7.78
	D. 30/40	42.04	10.51	8.00	85.2	4.42	93.25	D. 30/40	7.69
	P.O.J. 2878	29.98	14.38	5.58	88.7	4.31	90.93	P.O.J. 2878	6.58
	Mean:					4.74	100.00		
	Significant Difference, 20:1:					—	—		
	Sophia, Field 8 E. "A." Reaped 17.x.46 at 13.25 months.								
MEANS OF 4 PLOTS:	Co. 421	46.65	13.96	7.97	86.0	6.51	115.63	Co. 421	11.72
	D. 21/40	46.07	13.18	9.17	85.2	6.07	107.82	D. 21/40	10.71
	D. 2/40	40.55	14.18	6.73	88.4	5.75	102.13	D. 2/40	10.43
	D. 40/40	39.80	14.41	10.35	87.3	5.73	101.78	D. 40/40	10.05
	D. 30/40	38.08	13.73	12.19	85.6	5.23	92.90	D. 30/40	9.47
	P.O.J. 2878	33.35	13.45	11.60	87.2	4.48	79.57	P.O.J. 2878	7.49
	Mean:					5.63	100.00		
	Significant Difference, 20:1:					1.11	19.72		
	Sophia, Field 8 E. "B." Reaped 4.x.46 at 13.00 months.								
MEANS OF 4 PLOTS:	B. 37161	40.06	15.82	5.65	89.9	6.34	119.17	Co. 421	12.13
	Co. 421	40.80	14.52	4.69	88.0	5.92	111.28	B. 37161	11.11
	P.O.J. 2878	26.67	13.87	6.45	86.8	3.69	69.36	P.O.J. 2878	7.25
	Mean:					5.32	100.00		
	Significant Difference, 20:1					0.66	12.41		

FIRST RATOON VARIETY TRIALS REAPED IN BERBICE AND EAST DEMERARA.

Table VI records the results of this series of trials. With the exception of the Lusignan trial the experimental yields were satisfactory. Attention may be called to the following points:—

i. D.25/38 (Co. 421 x Diamond 10) has maintained its good performance as plant canes. It still leads P.O.J. 2878 by a considerable margin in all its trials and is significantly better in two of them;

ii. Both D.21/40 and Co. 331 (Co. 214 x Co. 213) have performed creditably as ratoons.

TABLE VI.—**Results of First Ratoon Variety Trials Reaped in Berbice and East Demerara.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
	Pln. Port	*Mouranie, Field*		*13 A.*	*Reaped*	*26.ix.46*	*at 11.75*	*months.*	
MEANS OF 5 PLOTS:	D. 25/38	47.48	13.85	5.35	88.8	6.58	106.99	D. 25/38	13.84
	Co. 331	46.20	13.65	5.18	87.0	6.31	102.60	Co. 331	12.88
	P.O.J. 2878	42.28	13.87	6.91	87.9	5.87	95.45	D. 21/40	11.53
	D. 21/40	48.14	12.11	14.20	83.1	5.83	94.80	P.O.J. 2878	10.88
	Mean:					6.15	100.00		
	Significant Difference, 20 : 1:					—	—		
	Pln. Rose	*Hall, Field*		*13 B.*	*Reaped*	*14.v.46*	*at 12.50*	*months.*	
MEANS OF 5 PLOTS:	Co. 331	43.03	14.12	5.72	87.4	6.08	111.36	Co. 331	11.96
	P.O.J. 2878	32.32	14.98	5.99	87.8	4.84	88.64	P.O.J. 2878	10.59
	Mean:					5.46	100.00		
	Significant Difference, 20 : 1:					—	—		
	Pln. Lusignan, Field 49			*W.M.R.*	*Reaped*	*2.v.46*	*at 12.25*	*months.*	
MEANS OF 5 PLOTS:	D. 25/38	26.64	14.07	4.66	86.5	3.75	124.17	D. 25/38	8.87
	P.O.J. 2878	17.25	13.36	4.92	86.9	2.30	76.16	P.O.J. 2878	7.11
	Mean:					3.02	100.00		
	Significant Difference, 20 : 1:					0.94	31.13		
	Pln.	*L.B.I., Field*		*38 L.R.*	*Reaped*	*2.viii.46*	*at 10.25*	*months.*	
MEANS OF 5 PLOTS:	Co. 331	51.08	12.36	9.70	83.1	6.31	108.42	Co. 331	14.21
	D. 25/38	45.64	13.39	5.26	86.1	6.11	104.98	D. 25/38	13.71
	D. 21/40	55.69	10.78	21.20	78.6	6.00	103.09	D. 21/40	12.27
	D. 2/40	42.29	12.89	7.38	84.6	5.45	93.64	D. 2/40	11.86
	P.O.J. 2878	39.57	13.18	7.57	83.9	5.21	89.52	P.O.J. 2878	11.78
	Mean:					5.82	100.00		
	Significant Difference, 20 : 1:					0.52	8.93		
	Pln.	*Ogle, Field*		*78 Gv.*	*Reaped*	*1.v.46*	*at 12.00*	*months.*	
MEANS OF 5 PLOTS:	Co. 331	35.53	12.52	4.36	86.6	4.45	113.23	Co. 331	11.31
	P.O.J. 2878	25.71	13.25	3.69	88.6	3.41	86.77	P.O.J. 2878	9.30
	Mean:					3.93	100.00		
	Significant Difference, 20 : 1:					0.31	7.89		

SUB-SECTION C.—SECOND RATOON VARIETY TRIALS.

Second Ratoon Variety Trials Reaped At Sophia Sugar Experiment Station.

Eight experiments were reaped and the results are summarized in Table VII. A study of the table reveals that:—

i. D.25/38 (Co. 421 x Diamond 10) has performed extremely well. It has significantly outyielded the standard in all 4 trials in which they both occur and its yields over a three crop cycle are decisively better than those of P.O.J. 2878;

ii. D.28/38 (Co. 421 x Diamond 10) significantly outyielded P.O.J. 2878 in two out of three trials;

iii. D.2/40 (Co. 281 x D.165/30) is significantly superior to P.O.J. 2878 in both trials in which they occur. D.21/40 (Co. 421 x Co. 419) and D.26/39 (Co. 421 x D.166/34) have maintained the superiority to the standard that they showed as plants and first ratoons.

TABLE VII.—**Results of Second Ratoon Variety Trials Reaped at Sophia Sugar Experiment Station.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.	Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons. Variety.	Sucrose in Cane per Acre, Tons.
		Sophia,	*Field*	*10 E.*	*Reaped*	*2.xii.46*	*at 12.50*	*months.*	
MEANS OF 4 PLOTS:	Co. 331	27.57	13.01	8.19	84.8	3.59	118.87	D. 25/38	14.45
	D. 25/38	24.86	13.91	5.90	86.4	3.46	114.57	Co. 331	13.35
	D. 28/38	18.64	14.18	7.34	85.8	2.64	87.42	D. 28/38	13.16
	P.O.J. 2878	17.64	13.59	8.75	86.5	2.40	79.47	P.O.J. 2878	11.06
	Mean:					3.02	100.00		
	Significant Difference, 20: 1:					0.67	22.19		
		Sophia,	*Field 2*	*W. "A."*	*Reaped*	*24.x.46*	*at 12.75*	*months.*	
MEANS OF 4 PLOTS:	Co. 331	42.62	12.77	6.18	87.2	5.44	115.01	Co. 331	16.68
	D. 25/38	40.39	12.96	5.96	87.6	5.23	110.57	D. 28/38	16.49
	D. 28/38	36.33	14.31	4.88	88.1	5.20	109.94	D. 25/38	15.94
	D. 2/40	34.22	13.00	6.96	85.7	4.45	94.08	D. 2/40	14.41
	P.O.J. 2878	25.54	13.08	6.06	87.1	3.34	70.61	P.O.J. 2878	11.22
	Mean:					4.73	100.00		
	Significant Difference, 20: 1:					0.77	16.28		
		Sophia,	*Field 5*	*W. "A."*	*Reaped*	*14.xi.46*	*at 13.25*	*months.*	
MEANS OF 4 PLOTS:	Co. 331	40.67	13.93	5.28	90.3	5.66	113.65	Co. 331	17.96
	D. 26/39	34.04	15.10	3.69	89.8	5.14	103.21	D. 26/39	16.28
	P.O.J. 2878	26.95	15.32	3.94	90.1	4.13	82.93	P.O.J. 2878	13.46
	Mean:					4.98	100.00		
	Significant Difference, 20: 1:					0.69	13.86		

TABLE VII (Contd.).—Results of Second Ratoon Variety Trials Reaped at Sophia Sugar Experiment Station.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.	Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons. Variety.	Sucrose in Cane per Acre, Tons.
		Sophia,	*Field 5*	*W. "B."*	*Reaped*	*31.x.46*	*at 13.00*	*months.*	
MEANS OF 4 PLOTS:	D. 2/40	42.57	14.87	4.17	89.5	6.33	135.84	D. 2/40	19.07
	P.O.J. 2878	21.29	14.04	4.46	88.7	2.99	64.16	P.O.J. 2878	13.10
	Mean:					4.66	100.00		
	Significant Difference, 20 : 1 :					0.54	11.59		
		Sophia,	*Field 11*	*W. "A."*	*Reaped*	*28.xi.46*	*at 13.25*	*months.*	
MEANS OF 4 PLOTS:	D. 21/40	34.73	12.18	10.81	86.7	4.23	115.26	D. 21/40	13.90
	D. 30/40	27.79	13.68	7.08	86.6	3.80	103.54	D. 30/40	12.76
	P.O.J. 2878	20.38	14.67	6.21	88.4	2.99	81.47	P.O.J. 2878	10.01
	Mean:					3.67	100.00		
	Significant Difference, 20 : 1:					0.48	13.08		
		Sophia,	*Field 11*	*W. "B."*	*Reaped*	*28.xi.46*	*at 13.00*	*months.*	
MEANS OF 4 PLOTS:	D. 25/38	35.17	13.71	5.49	86.5	4.82	113.68	Co. 331	15.17
	Co. 331	40.68	11.48	8.53	84.1	4.67	110.14	D. 25/38	14.21
	P.O.J. 2878	23.91	13.53	7.11	85.1	3.23	76.18	P.O.J. 2878	9.87
	Mean:					4.24	100.00		
	Significant Difference, 20 : 1 :					0.52	12.26		
		Sophia,	*Field 12*	*W. "A."*	*Reaped*	*22.xi.46*	*at 13.00*	*months.*	
MEANS OF 4 PLOTS:	D. 28/38	29.62	15.54	5.19	88.3	4.60	111.38	D. 28/38	13.92
	Co. 331	34.29	12.20	8.19	86.7	4.18	101.21	Co. 331	13.74
	P.O.J. 2878	26.65	13.54	6.91	86.4	3.61	87.41	P.O.J. 2878	12.04
	Mean:					4.13	100.00		
	Significant Difference, 20 : 1:					0.42	10.17		
		Sophia, Field 12		*W. "B."*	*Reaped*	*20.xi.46*	*at 13.00*	*months.*	
MEANS OF 4 PLOTS:	D. 25/38	37.27	15.77	5.28	90.4	5.88	121.99	D. 25/38	17.52
	Co. 331	36.93	12.71	5.82	84.9	4.69	97.30	Co. 331	15.75
	P.O.J. 2878	25.37	15.32	4.52	89.4	3.89	80.71	P.O.J. 2878	12.81
	Mean:					4.82	100.00		
	Significant Difference, 20 : 1:					0.48	9.96		

SECOND RATOON VARIETY TRIALS REAPED IN BERBICE AND EAST DEMERARA.

The results of the three trials are summarized in Table VIII. Yields at Albion and Enmore are an improvement upon those obtained as first ratoons but are still somewhat low. We may note that:—

i. B.34104 (Co. 281 x B.H. 10/12) and D. 200/36 (P.O.J. 2878 x Co. 213) significantly outyielded P.O.J. 2878 in the Port Mourant trial. In no other trial are the results significant, although over a total yield for 3 crops D. 200/36 and D. 25/38 lead the standard by fair margins in the Enmore trial.

TABLE VIII.—**Results of Second Ratoon Variety Trials Reaped in Berbice and East Demerara.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
	Pln. Port	*Mourant,*	*Field*	*5 A.E.*	*Reaped*	*13.iii.46*	*at 12.00*	*months.*	
MEANS OF 5 PLOTS:	B. 34104	39.96	16.75	4.16	91.1	6.69	114.95	B. 34104	24.04
	D. 200/36	37.84	16.41	4.85	89.9	6.21	106.70	D. 200/36	21.32
	P.O.J. 2878	27.86	16.39	3.94	91.5	4.56	78.35	P.O.J. 2878	18.03
	Mean:					5.82	100.00		
	Significant Difference, 20: 1:					1.17	20.10		
	Pln.	*Albion,*	*Field*	*24 K.*	*Reaped*	*15.iii.46*	*at 12.00*	*months.*	
MEANS OF 5 PLOTS:	D. 200/36	30.17	14.24	3.82	86.8	4.30	104.88	P.O.J. 2878	11.64
	P.O.J. 2878	28.70	14.47	7.86	85.9	4.15	101.22	D. 25/38	11.13
	D. 25/38	28.32	13.56	5.31	86.1	3.84	93.66	D. 200/36	10.92
	Mean:					4.10	100.00		
	Significant Difference, 20: 1:					—	—		
	Pln. E	*nmore,*	*Field*	*4 B.A.*	*Reaped*	*14.iii.46*	*at 13.00*	*months.*	
MEANS OF 5 PLOTS:	D. 25/38	25.71	13.52	5.42	84.9	3.48	107.74	D. 25/38	10.57
	D. 200/36	26.15	11.97	8.26	80.4	3.13	96.90	D. 200/36	10.08
	P.O.J. 2878	22.15	13.83	5.73	84.5	3.07	95.05	P.O.J. 2878	8.00
	Mean:					3.23	100.00		
	Significant Difference, 20: 1:					—	—		

SECOND RATOON VARIETY TRIALS REAPED IN WEST DEMERARA.

Six experiments have been reaped and the results are tabulated below (Table IX). Yields tend to be low although juices were of good quality. This series of trials is remarkable for the consistently good performance of the seedling D. 26/39. As second ratoons it has outyielded the standard by a significant margin in 3 of the 5 trials in which it occurs, while over the three crop cycle it leads P.O.J. 2878 quite considerably in all trials. It is especially interesting to note that this seedling has been selected on pegassy clay and all six trials are on this soil type.

TABLE IX.—Results of Second Ratoon Variety Trials Reaped in West Demerara.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.	Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons. Variety.	Sucrose in Cane per Acre, Tons.
	Pln. Wales, Field 32 Y.R. Reaped					*13.iii.46*	*at 11.75*	*months.*	
MEANS OF 5 PLOTS :	P.O.J. 2878	17.72	12.21	10.37	85.8	2.16	109.64	D. 26/38	11.49
	D. 26/38	15.61	11.46	9.14	85.0	1.79	90.86	P.O.J. 2878	10.08
	Mean :					1.97	100.00		
	Significant Difference, 20 : 1 :					—	—		
	Pln. Versailles, Field 14 K.P. Reaped					*19.ix.46*	*at 12.25*	*months.*	
MEANS OF 5 PLOTS :	D. 26/39	33.39	16.15	4.20	90.6	5.39	116.67	D. 26/39	19.31
	P.O.J. 2878	26.25	14.69	7.98	85.3	3.85	83.33	P.O.J. 2878	13.46
	Mean :					4.62	100.00		
	Significant Difference, 20 : 1 :					1.49	32.25		
	Pln. Leonora, Field 34 E.C.I. Reaped					*25.iv.46*	*at 11.50*	*months.*	
MEANS OF 5 PLOTS :	D. 26/39	21.76	16.00	2.59	92.2	3.48	123.84	D. 26/39	11.65
	P.O.J. 2878	14.16	15.07	4.80	89.7	2.14	76.16	P.O.J. 2878	8.92
	Mean :					2.81	100.00		
	Significant Difference, 20 : 1 :					0.51	18.14		
	Pln. Uitvlugt, Field 42 De W. Reaped					*21.viii.46*	*at 11.75*	*months.*	
MEANS OF 5 PLOTS :	D. 26/39	27.87	16.08	5.19	91.4	4.48	105.66	D. 26/39	13.75
	P.O.J. 2878	25.09	15.95	6.71	89.7	4.00	94.34	P.O.J. 2878	11.11
	Mean :					4.24	100.00		
	Significant Difference, 20 : 1 :					—	—		
	Pln. DeKinderen, Field 17 E. Reaped					*11.iv.46*	*at 11.50*	*months.*	
MEANS OF 5 PLOTS :	D. 26/39	22.41	16.25	4.09	91.7	3.64	116.29	D. 26/39	11.11
	P.O.J. 2878	16.80	15.63	5.89	88.3	2.63	84.03	P.O.J. 2878	9.45
	Mean :					3.13	100.00		
	Significant Difference, 20 : 1 :					0.24	7.67		
	Pln. DeKinderen, Field 82 W. Reaped					*14.viii.46*	*at 12.00*	*months.*	
MEANS OF 5 PLOTS :	D. 26/39	15.91	14.94	7.20	91.2	2.38	111.21	D. 26/39	8.03
	P.O.J. 2878	12.39	15.40	8.69	90.2	1.91	89.25	P.O.J. 2878	6.48
	Mean :					2.14	100.00		
	Significant Difference, 20 : 1 :					—	—		

DISCUSSION AND SUMMARY.

Table X compares the performance of all the canes on the basis of their sucrose yields in all experiments to date, P.O.J. 2878 serving as a standard. Table XI compares for some of the more important varieties, certain data indicative of cane quality.

TABLE X.—General Mean Sucrose Yields in Tons per Acre from all Experiments.

Variety.	Plants.		First Ratoons.		Second Ratoons.		Total Yield.	Total Yield, P.O.J. 2878 = 100.00.
	Yield.	No. of Expts.	Yield.	No. of Expts.	Yield.	No. of Expts.		
	Three Crops, Plants, First and Second Ratoons.							
Co. 421	5.99	15	5.42	12	4.58	9	15.99	139.41
D. 14/34	5.72	13	5.42	10	4.68	8	15.82	137.93
B. 34104	5.52	17	4.97	10	4.64	9	15.13	131.91
D. 2/40	5.21	10	4.53	5	5.30	2	15.04	131.12
D. 25/38	5.77	14	4.73	11	4.28	8	14.78	128.86
D. 14/33	5.36	13	5.02	9	4.31	9	14.69	128.07
D. 26/39	5.40	6	5.12	6	4.08	6	14.60	127.29
D. 28/38	5.82	7	4.56	4	4.18	4	14.56	126.94
D. 21/40	5.61	10	4.43	5	4.40	1	14.44	125.89
Co. 331	5.28	11	4.72	11	4.26	6	14.26	124.32
D. 200/36	5.33	13	5.08	9	3.79	9	14.20	123.80
D. 30/40	5.73	6	4.02	3	3.95	1	13.70	119.44
D. 26/38	5.93	1	4.20	1	2.58	1	12.71	110.81
P.O.J. 2878	**4.65**	**189**	**3.71**	**133**	**3.11**	**97**	**11.47**	**100.00**
	Two Crops, Plants and First Ratoons.							
D. 40/40	6.67	1	4.75	1	—	—	11.42	136.60
B. 37161	4.27	3	6.37	1	—	—	10.64	127.27
P.O.J. 2878	**4.65**	**189**	**3.71**	**133**	—	—	**8.36**	**100.00**
	One Crop, Plants only.							
D. 21/41	6.78	1	—	—	—	—	6.78	145.81
D. 20/41	6.43	1	—	—	—	—	6.43	138.28
D. 103/41	6.34	1	—	—	—	—	6.34	136.34
D. 37/41	5.93	1	—	—	—	—	5.93	127.53
D. 40/41	5.91	2	—	—	—	—	5.91	127.10
D. 161/41	5.88	1	—	—	—	—	5.88	126.45
D. 55/41	5.79	1	—	—	—	—	5.79	124.52
D. 34/41	5.77	2	—	—	—	—	5.77	124.09
D. 62/41	5.76	1	—	—	—	—	5.76	123.87
D. 155/41	5.75	1	—	—	—	—	5.75	123.66
D. 156/41	5.63	1	—	—	—	—	5.63	121.08
D. 35/41	5.61	1	—	—	—	—	5.61	120.65
D. 117/41	5.60	1	—	—	—	—	5.60	120.43
D. 81/41	5.53	1	—	—	—	—	5.53	118.92
D. 1/41	5.51	1	—	—	—	—	5.51	118.49
D. 28/41	5.47	1	—	—	—	—	5.47	117.63
D. 75/41	5.45	1	—	—	—	—	5.45	117.20
D. 49/41	5.42	1	—	—	—	—	5.42	116.56
D. 31/41	5.41	2	—	—	—	—	5.41	116.34
D. 27/41	5.40	2	—	—	—	—	5.40	116.13
D. 118/41	5.38	1	—	—	—	—	5.38	115.70
D. 36/41	5.37	1	—	—	—	—	5.37	115.48
D. 142/41	5.31	1	—	—	—	—	5.31	114.19
D. 51/41	5.30	1	—	—	—	—	5.30	113.98
D. 24/41	5.27	1	—	—	—	—	5.27	113.33
D. 38/41	5.25	1	—	—	—	—	5.25	112.90
D. 93/41	5.23	2	—	—	—	—	5.23	112.47
D. 26/41	5.21	2	—	—	—	—	5.21	112.04
D. 125/41	5.19	1	—	—	—	—	5.19	111.61

TABLE X. (Contd.)—**General Mean Sucrose Yields in Tons per Acre from all Experiments.**

Variety.	Plants.		First Ratoons.		Second Ratoons.		Total Yield.	Total Yield, P.O.J. 2878 = 100.00.
	Yield.	No. of Expts.	Yield.	No. of Expts.	Yield.	No. of Expts.		
		One	*Crop,*	*Plants*	*only.*—	*(Contd.)*		
D. 39/41	5.18	1	—	—	—	—	5.18	111.40
D. 92/41	5.18	1	—	—	—	—	5.18	111.40
D. 44/41	5.17	1	—	—	—	—	5.17	111.18
D. 46/41	5.15	1	—	—	—	—	5.15	110.75
D. 29/41	5.13	2	—	—	—	—	5.13	110.32
D. 165/41	5.13	1	—	—	—	—	5.13	110.32
D. 19/41	5.10	1	—	—	—	—	5.10	109.68
D. 68/41	5.08	1	—	—	—	—	5.08	109.25
D. 113/41	4.96	1	—	—	—	—	4.96	106.67
D. 61/41	4.95	1	—	—	—	—	4.95	106.45
D. 97/41	4.95	1	—	—	—	—	4.95	106.45
D. 56/41	4.94	1	—	—	—	—	4.94	106.24
D. 178/41	4.93	1	—	—	—	—	4.93	106.02
D. 54/41	4.91	1	—	—	—	—	4.91	105.59
B. 3337	4.90	2	—	—	—	—	4.90	105.38
B. 37193	4.89	1	—	—	—	—	4.89	105.16
D. 145/41	4.88	1	—	—	—	—	4.88	104.95
D. 84/41	4.87	1	—	—	—	—	4.87	104.73
D. 107/41	4.84	1	—	—	—	—	4.84	104.09
D. 129/41	4.83	1	—	—	—	—	4.83	103.87
D. 76/41	4.80	1	—	—	—	—	4.80	103.23
D. 147/41	4.69	2	—	—	—	—	4.69	100.86
D. 2/41	4.67	1	—	—	—	—	4.67	100.43
D. 101/41	4.66	1	—	—	—	—	4.66	100.22
P.O.J. 2878	**4.65**	**189**	—	—	—	—	**4.65**	**100.00**
D. 4/41	4.52	1	—	—	—	—	4.52	97.20
D. 8/41	4.50	1	—	—	—	—	4.50	96.77
D. 30/41	4.42	1	—	—	—	—	4.42	95.05
D. 135/41	4.38	1	—	—	—	—	4.38	94.19
D. 98/41	4.35	1	—	—	—	—	4.35	93.55
D. 174/41	4.35	1	—	—	—	—	4.35	93.55
D. 79/41	4.32	1	—	—	—	—	4.32	92.90
D. 32/41	4.27	1	—	—	—	—	4.27	91.83
D. 136/41	4.26	1	—	—	—	—	4.26	91.61
D. 127/41	4.25	1	—	—	—	—	4.25	91.40
D. 123/41	4.23	1	—	—	—	—	4.23	90.97
D. 132/41	4.22	1	—	—	—	—	4.22	90.75
D. 33/41	4.19	2	—	—	—	—	4.19	90.11
D. 77/41	4.19	2	—	—	—	—	4.19	90.11
D. 112/41	4.19	2	—	—	—	—	4.19	90.11
D. 60/41	4.19	1	—	—	—	—	4.19	90.11
D. 91/41	4.07	1	—	—	—	—	4.07	87.53
D. 82/41	4.03	1	—	—	—	—	4.03	86.67
D. 10/41	3.99	1	—	—	—	—	3.99	85.81
D. 71/41	3.99	1	—	—	—	—	3.99	85.81
D. 131/41	3.94	1	—	—	—	—	3.94	84.73
D. 72/41	3.91	1	—	—	—	—	3.91	84.09
D. 25/41	3.75	1	—	—	—	—	3.75	80.65
D. 69/41	3.72	1	—	—	—	—	3.72	80.00
D. 90/41	3.34	1	—	—	—	—	3.34	71.83

TABLE XI.—The Quality of the Most Promising Seedlings as Compared with P.O.J. 2878.

Variety.	Pol. % Cane.		Juice Purity.		Glucose Ratio.		Fibre % Cane.	
	% of P.O.J. 2878.	No. of Comparisons.	% of P.O.J. 2878.	No. of Comparisons.	% of P.O.J. 2878.	No. of Comparisons.	% of P.O.J. 2878.	No. of Comparisons
D. 14/33	107.92	31	103.11	31	73.69	31	106.71	29
D. 14/34	110.11	31	103.13	31	75.26	31	107.01	29
D. 200/36	100.21	31	100.11	31	101.26	31	107.56	30
D. 25/38	99.92	33	101.25	33	77.93	33	118.28	29
D. 26/38	93.86	1	99.07	1	88.14	1	113.46	1
D. 28/38	109.05	15	101.81	15	65.41	15	112.57	5
D. 38/38	108.92	3	102.48	3	92.41	3	85.07	1
D. 26/39	104.47	18	102.19	18	67.23	18	97.16	6
D. 2/40	97.97	10	99.99	10	93.61	10	—	—
D. 21/40	89.01	16	95.83	16	159.13	16	99.48	9
D. 30/40	94.30	10	99.12	10	96.35	10	110.18	6
D. 40/40	106.85	2	100.23	2	105.68	2	102.85	1
D. 49/41	105.43	1	103.53	1	101.33	1	—	—
D. 93/41	94.53	2	96.87	2	175.95	2	94.84	1
D. 103/41	92.58	1	98.80	1	144.64	1	96.46	1
D. 142/41	104.79	1	102.41	1	61.48	1	93.61	1
B. 3337	91.03	2	97.64	2	135.50	2	105.37	2
B. 34104	104.04	36	101.92	36	88.68	36	112.30	34
B. 37161	104.09	4	99.74	4	89.27	4	87.72	4
B. 37193	92.57	1	96.93	1	104.82	1	125.99	1
Co. 331	94.02	28	98.81	28	90.71	28	114.35	27
Co. 419	101.01	29	99.79	29	96.49	29	97.87	26
Co. 421	102.76	36	100.91	36	86.14	36	110.40	36
P.O.J. 2878	100.00	—	100.00	—	100.00	—	100.00	—

The position of the varieties under test may be clarified by regarding them as falling into the following groups :—

i. Canes fully tested and extended under commercial conditions. This group consists of the following:— Co. 421, D. 14/34, B. 34104, D. 14/33 and D. 200/36. Of these, Co. 421, D. 14/34 and B. 34104 have justified the confidence expressed in their ability in Sugar Bulletin No. 14 and are found once more at the head of the table. D. 14/33 has performed well in commercial plantings in some areas whilst D. 200/36 has proved to be definitely superior to P.O.J. 2878 and should be maintained and observed on Estates in view of its very desirable erect habit;

ii. Canes extensively tested experimentally but not yet planted on a commercial scale. In this group we find two seedlings of the 1938 series—D. 25/38 and D. 28/38, one of the '39 series—D. 26/39 and three of the '40 series—D. 2/40, D. 21/40 and D. 30/40. With the possible exception of D. 26/39 which has performed consistently well on pegasse soils, none of these threaten to take the place of the leading canes in group I, although all have decisively beaten the standard cane P.O.J. 2878. Co. 331 continues to perform well but its indifferent juice mitigates against any commercial extension;

iii. Canes where experimental testing is incomplete. In this group we find the three Barbados seedlings B. 37161 (B.3365 x B.603), B. 3337 (B. 30 L.7 selfed) and B. 37193 (B. 3365 x B. 603), D.40/40 and the large series of 1941 seedlings. No comment on their performance is justified until more data has been accumulated.

A study of the tables will reveal the fact that the cane used as a standard—P.O.J. 2878 is now being decisively and consistently beaten by at least 5 varieties which may be regarded as canes of commercial importance. It has been decided, therefore, to discontinue its use as a standard and to replace it by the varieties Co. 421 and D. 14/34. It is considered that the use of two standards is justified at the present stage by the fact that variety trials take place over a wide ecological area and are reaped both as Spring and Autumn canes at varying stages of maturity. Under these circumstances the use of a single variety as standard may give rise to misleading results under certain conditions.

It will be seen from the above that the experiments reaped in 1946 have largely confirmed the 1945 position with regard to the leading varieties and no outstanding seedling can be recommended this year for commercial extension. D. 2/40 (Co. 281 x D. 165/30) and D. 25/38 (Co. 421 x Diamond 10) are high in the table but their extension is not advised on account of their indifferent juice. Estates are therefore advised to continue their main plantings on the varieties recommended in Bulletin 14—D. 14/34, B. 34104, Co. 421 and D. 14/33. D. 200/36 merits small scale planting in view of its possible importance as a cane suitable for mechanical harvesting, whilst the seedling D. 26/39 can be established and observed on a nursery basis, with a view to being extended on the Pegassy clay soils.

MANURIAL TRIALS.

The results of 8 manurial experiments harvested during the period under review, are presented in four sub-sections, *viz.*,

A—Phosphatic manures,

B—Liming materials,

C—Organic manures,

D—Discussion and summary.

In addition, the station carried out a series of manurial trials designed to test whether or not the Holme Maize Microplot could be used to indicate fertilizer requirements of cane on British Guiana soils. Six such tests were reaped but the results are inconclusive and it was decided to postpone their discussion until more data was available.

SUB-SECTION A.—PHOSPHATIC MANURES.

(A1—A3) Phosphatic Manuring on Flood-fallowed Frontland.

Fields 3 Ab., 13 B.L., and 64 B.L., Blairmont.

(Plant cane results reported in Sugar Bull. No. 13, p. 24, and first ratoon in No. 13, p. 24.)

(First ratoon results reported in Sugar Bull. No. 14, p. 19.)

The results of the three trials as summarized in Table XII are of interest. Neither of the two Bush lot fields (13 B.L. and 64 B.L.) have responded to phosphatic manuring at any stage during the crop cycle. By contrast, field 3 Ab. as plants, gave some indication of differential response between treatments. This difference was again to be observed in the first ratoon yields and culminated by attaining statistical significance as second ratoons. It will be seen that the three levels of Superphosphate application do not differ from one another significantly in effect upon yield although all three are significantly better than the control. It should be noted that although all three fields are here grouped as "Flood fallowed frontland" recent investigations have shown that the soil of the two Bush Lot fields is of a different series to that of 3 Ab. It is not surprising therefore to find them differing in their response to dressings of calcium superphosphate.

TABLE XII.—Residual Effect of Superphosphate on Flood-fallowed Frontland.

Superphosphate, Cwt./Acre.	lb. P_2O_5	Mean Yields in Tons Cane per Acre. Blairmont. Field 3 Ab., P.O.J. 2878. 2nd Ratoons.	Field 3 Ab., P.O.J. 2878. Total for 3 Crops.	Field 13 B.L., Co. 419. 2nd Ratoons.	Field 13 B.L., Co. 419. Total for 3 Crops.	Field 64 B.L., P.O.J. 2878. 3rd Ratoons.	Field 64 B.L., P.O.J. 2878. Total for 2 Crops.
0	—	15.07	99.37	51.55	169.29	18.53*	42.34
3	54	18.04	106.41	50.27	166.98	17.90*	41.82
6	108	17.84	105.46	47.83	166.98	17.34*	38.45
9	162	17.04	104.92	47.57	165.34	16.84*	37.84
Sig. Diff., 20:1:		1.94		—		—	

* Experiment commenced on 1st Ratoons, plant canes not treated; 2nd Ratoons reaped by Estate.

(A4) PHOSPHATIC MANURING ON FLOOD-FALLOWED RIVERSIDE CLAY.

Field 3 R., Blairmont.

Table XIII summarises the results of a similar trial laid down on a different soil type. Applications of phosphate have had no significant effect on the plant cane yields and it will be interesting to note whether or not residual benefits occur as ratoons.

TABLE XIII.—Effect of Superphosphate on Plant Canes on Flood-fallowed Riverside Clay.

Superphosphate, Cwt./Acre.	lb. P_2O_5	Mean Yields in Tons Cane per Acre. Blairmont, Field 3 R., Diamond 10.
0	—	33.85
3	54	34.87
6	108	37.32
9	162	35.55

Differences not statistically significant.

SUB-SECTION B.—LIMING MATERIALS.

(B1—B2) Liming Materials on Flood-fallowed Frontland.

Fields 71 B.L., Blairmont and 31 K., Albion.

It should again be pointed out that the fields here grouped together as "Flood Fallowed Frontland" may belong to different soil types. At Blairmont no effect due to liming is to be observed. The Albion trial (Field 31 K) has been in progress for 3 crop cycles and is designed to test whether a small "precautionary" dose of lime applied to plant canes is of benefit in combating any tendency towards increased acidity which repeated applications of Sulphate of Ammonia may have over an extended period. The trial in question has twice been treated with Lime and Ground Limestone and once with ground Limestone only, the applications in each case being made on the plant canes. Beyond a significant depression of the yields for 1st cycle, 1st ratoons treated with ½ ton/acre slaked lime no response to either treatment has occurred at any stage of the experiment, and it would therefore seem that over a 9-year period there is little to be gained from this system of application of liming materials on this soil type.

Table XIV.—**Effect of Liming Materials on Flood-fallowed Frontland.**

Treatments per Acre.	Mean Yields in Tons Cane per Acre.	
	Blairmont, Field 71 B.L., D. 14/33.	Albion, Field 31 K., D. 14/33.
	Plants.	1st Ratoons.
No Liming Materials	43.78	36.39
Lime 0.5 Tons	46.00	—
„ 1.0 „	43.85	—
Ground Limestone 0.5 „	43.13	33.90*
„ „ 1.0 „	46.55	36.18*
Ground Limestone in former Lime plots 0.5 „	—	36.95*
Ground Limestone in former Lime plots 1.0 „	—	34.45*

Differences not statistically significant.

* Residual effect from Plant cane application. Plant cane reaped by Estate.

SUB-SECTION C.—ORGANIC MANURES.

(CI) Molasses on Flood-fallowed Frontland.

Field 5 Rp., Blairmont.

(Plant cane results reported in Sugar Bull. No. 14, p. 21.)

Table XV is of interest in that the significant difference between control and those treatments containing sulphate of ammonia present in the 1943 reaping but absent in the plant crop of 1945 reappear in the 1st Ratoons of 1946. Thus we may conclude (as suggested by Williams in Sugar Bulletin No. 14) that with the wearing off of the general high level of fertility produced by the flood fallow, differences between treatments once again become prominent. The only treatment involving molasses alone (10 tons/acre on bank) has had no residual effect and does not differ significantly from the control. The remaining treatments all received an application of sulphate of Ammonia and are all significantly better than control. Three of them were treated with molasses plus supplementary dressings of 2 cwt./acre Sulphate of Ammonia. The fourth received the standard ratoon application of 4 cwt./acre Sulphate of Ammonia but no molasses. They do not differ significantly in yield.

Table XV.—**Effect of Molasses on Flood-fallowed Frontland.**

Fertilizer.	Treatments per Acre.			Mean Yields in Tons Cane per Acre. Field 5 Rp., Blairmont.			
				Diamond 10.	D. 14/34.		Toal for 3 Crops.
	3rd Ratoons, 1943.	Plants, 1945.	1st Ratoons, 1946.	3rd Ratoons, 1943.	Plants, 1945.	1st Ratoons, 1946.	
No Manure	—	—	—	35.78	51.33	37.27	124.38
Amm. Sulph., Cwt.	4	2	4	41.55	51.17	46.87	139.59
Molasses on Bank, Tons.	5	—	—	41.20	49.90	46.28	137.38
Amm. Sulph., Cwt.	2	1	2				
Molasses in Row, Tons.	5	—	—	43.00	53.15	45.20	141.35
Amm. Sulph., Cwt.	2	1	2				
Molasses on Bank, Tons.	10	—	—	36.05	52.07	36.46	124.58
„ in Row, Tons.	10	—	2	37.58	52.76	46.09	136.43
Sig. Diff., 20:1:				3.81	—	4.60	

(C 2) Molasses on Pegassy Clay.

Field 6 Rp., Blairmont.

(Plant cane results reported in Sugar Bull. No. 14, pp. 21 and 22.)

The results of molasses manuring on this soil type differ very markedly from those obtained on Frontland clay although it will be seen that the effect of flood fallowing in raising the general level of fertility and so mashing

treatment differences is once more apparent. The no manure treatment is the lowest in respect to yield while the only treatments to differ from it significantly are the two involving applications of 10 tons/acre molasses as plants. Of these, the molasses on bank treatment is significantly better than the molasses in row treatment, in spite of the fact that the latter has received a supplementary dressing of 2 cwt./acre sulphate of ammonia. The evidence thus indicates that on this soil type, molasses, especially heavy initial dressings, exercises a profound residual effect which considerably outweighs the benefits due to supplementary doses of inorganic nitrogenous manures. This is the reverse of the situation obtained in the Frontland clay.

TABLE XVI.—Effect of Molasses on Pegassy Clay.

Fertilizer.	Treatments per Acre.			Mean Yields in Tons Cane per Acre. Field 6 Rp., Blairmont.			
				P.O.J. 2878.	D. 14/34.		
	3rd Ratoons, 1943.	Plants, 1945.	1st Ratoons, 1946.	3rd Ratoons, 1943.	Plants, 1945.	1st Ratoons, 1946.	Total for 3 Crops.
No Manure	—	—	—	18.00	29.81	27.91	75.72
Amm. Sulph., Cwt.	4	2	4	29.52	37.77	29.21	96.50
Molasses on Bank, Tons.	5	—	—	31.19	37.68	28.21	97.08
Amm. Sulph., Cwt.	2	1	2				
Molasses in Row, Tons.	5	—	—	30.00	33.33	32.53	95.86
Amm. Sulph., Cwt.	2	1	2				
Molasses on Bank, Tons.	10	—	—	28.45	35.84	41.09	105.38
„ in Row, Tons.	10	—	2	26.40	35.90	34.74	97.04
Sig. Diff., 20:1:				3.63	—	6.11	

SUB-SECTION D.—DISCUSSION AND SUMMARY.

Little need be added to the comments made on the individual trials. Of the 4 phosphatic manure trials only one gave results in which the treatments differed statistically and this indicated that on the soil type of Field 3 Ab. Blairmont, dressings of 3, 6 & 9 cwt./acre superphosphate applied on plants exercise a beneficial residual effect on second ratoons. It should perhaps be pointed out that the average yield in this trial is very low. The results of the liming trials, especially that in field 31 K Albion indicate that the policy of applying small doses of lime at the commencement of each crop cycle may not be justified. No benefits from such applications are apparent as late as the 2nd crop of the third cycle. The organic manure trials show that the residual effect of molasses is slight in "Frontland clay" but appears to be considerable in pegassy clay.

CULTIVATION TRIALS.

In addition to its programme of varietal and manurial research, the station has, established, over the last three years, a series of cultivation trials. Results and a preliminary discussion of some of these were presented in a paper read before the 1946 meeting of the British West Indies Sugar Technologists (Williams, C. Holman B., and Cameron, C. 1946. "Trials of Modified Cultivation Systems for British Guiana" in press). Subsequently some of the trials reported in this paper have been reaped a second time as ratoons whilst the results from other trials have become available. The data obtained from 10 trials of the 1946 Crop is presented below in two Sub-sections, viz:—

E—Cultivation trials,

F—Discussion and summary.

SUB-SECTION E.

(E 1—E 2) *Field 1 A.O.G., Port Mourant.*

The results from this trial have already been reported in the Williams and Cameron paper. They are given here in Table XVII, for the sake of completeness, and will not be discussed.

TABLE XVII.—Results of a Cultivation Trial on Flood-fallowed Frontland.

Treatment No.	Bed Width, Ft.	Rows, 6 Ft. apart.	Treatments.	Mean Yields in Tons Cane per Acre. Field 1 A.O.G., Port Mourant. P.O.J. 2878.		
			Tile drains of 3 ins. diameter bore, laid 2 ft. deep (additional to usual open drains separating beds).	Plants.	1st Ratoons.	Total for 2 Crops.
I	36	Cross	None.	32.24	28.37	60.61
II	36	Long	None.	31.58	34.02	65.60
III	36	„	Across bed every 12 ft. opening into drains.	39.29	34.92	74.21
IV	36	„	Two, along bed, opening into main central drain (fourfoot). Tile drains 12 ft. from open drains and from each other.	38.57	36.56	75.13
V	18	„	None.	37.74	35.11	72.85
VI	18	Cross	None.	34.73	33.38	68.11
VII	12	Long	None (Cameron-Williams System).	39.04	35.81	74.85
			Mean :	36.17	34.02	70.19
			Sig. Diff., 20:1:	2.88	4.64	

(E 3—E 4) *Field 5 L., Bath.*

It will be noticed from Table XVIII that treatments III and IV and treatments V and VI differ only in the details of their ratoon tillage and their yields were not treated separately as plants. The results for first ratoons differ significantly but are difficult of interpretation, although it will be seen that with the exception of the Cameron-Williams system, all the treatments have significantly outyielded the control. Since they all involve modifications aimed at improvements in draining (a reduction in bed width in treatments III, IV, V and VI and the addition of subsoil drains in treatment II) this result is in general agreement with the conclusions of Williams and Cameron *ibid* who found "that the cane yield can be materially increased by improving on the drainage furnished by the normal 37 ft. bed with cross rows".

TABLE XVIII.—Results of a Cultivation Trial on Flood-fallowed Frontland.

Treatment No.	Bed Width, ft.	Direction of Rows (6 ft. apart) on Beds.	Treatments.	Mean Yields in Tons Cane per Acre.			
				Field 5 L., Bath.			
			Tile Drains of 3 in. Diameter bore, laid 2 ft. deep (additional to usual open drains separating beds).	P.O.J. 2878.			
				Plants.	Ratoons Tillage.	1st Ratoons.	Total for 2 Crops.
I	36	Across	None (normal layout as Control).	43.28	Normal	38.99	82.27
II	36	Along	Two, along the bed, 12 ft. apart and 12 ft. from normal drains, opening into main central drain of field.	45.94	„	52.20	98.14
III	24	„	None.	46.02*	„	51.05	97.07
IV	24	„	None.		No hilting up of rows	50.37	96.39
V	24	„	One, along the bed, 12 ft. from normal drains, opening into main central drain of field.	52.16*	Normal	48.88	101.04
VI	24	„	One, along the bed, 12 ft. from normal drains, opening into main central drain of field.		No hilting up of rows	56.01	108.17
VII	12	„	None (Cameron-Williams System).	45.53	Normal	43.99*	89.52
			Mean :	46.59		48.78	
			Sig. Diff., 20:1:	—		6.78	

* Means of 6 Replicates.

(E 5) *Field 16—80., Skeldon.*

It will be seen from Table XIX that there is no statistically significant difference between treatments. If, however, the three 24 ft. bed treatments (IV, V and VI) be compared with the three 36 ft. bed treatments (I, II and III) it will be seen that they have consistently outyielded the latter, and that the mean yield is almost 4 tons cane/acre higher. This is in general agreement with the results of the two previous tests. The yield from treatment VIII suggests the possibility that sand drains may be effective in improving drainage at the standard 36 ft. bed.

TABLE XIX.—**Results of a Cultivation Trial on Flood-fallowed Frontland.**

Treatment No.	Bed Width, Ft.	Treatments.	Mean Yields in Tons Cane per Acre. Field 16, Section 80, Skeldon. Plants, Co. 421.
I	36	Cross Rows. Ratoons hilled up	36.18
II	36	" " " Flat Forked	33.69
III	36	" " " Untilled	36.24
IV	24	Long " " hilled up	37.56
V	24	" " " Flat Forked	38.35
VI	24	" " " Untilled	41.70
VII	12	6 C.W. Beds bordered by a single row bed on each side.	40.06
VIII	36	6 Long Rows with auxiliary sand drains 2 ft. deep.	40.36
		Mean :	38.02
		Differences not statistically significant.	—

(E 6 — E 7) *Field 1 E., Sophia.*

The ratoon results in this experiment (Table XX) differ from those obtained in the plant crop in that treatment differences are no longer significant. It will be seen however, that for two crops the twenty-four ft. bed treatments have decisively outyielded the standard estate 36 ft. bed. The single row bed and the Cameron-Williams treatments have also outyielded the control, but the difference is less marked as first ratoons than as plants.

TABLE XX.—Results of a Cultivation Trial on Flood-fallowed Frontland.

Treatment No.	Treatments. (Row Centres 5 ft. apart).	Mean Yields in Tons Cane per Acre. Field 1 E., Sophia. Co. 421. Plants.	1st Ratoons.	Total for 2 Crops.
I	5 ft. Bed with single row along bed	28.85	46.35	75.20
II	10 ft. „ „ 2 rows „ „ (Cameron-Williams System)	24.52	47.19	71.71
III	36 ft. „ „ rows across bed	23.16	43.82	66.98
IV	24 ft. „ „ „ „ „	27.32	48.85	76.17
V	24 ft. „ „ 5 rows along „	33.91	48.07	81.98
	Mean :	27.55	46.86	
	Sig. Diff., 20: 1:	4.35	—	

(E 8 — E 9) *Field 7 W., Sophia.*

In reporting the results of these trials as plants Williams and Cameron concluded that D.200/36 was the highest yielder and that the method of planting over the entire C.W. bed was responsible for higher yields. The first ratoon results differ quite markedly from those obtained as plants and it will be seen (from Table XXI) that whereas D.200/36 is still superior by a significant margin to its two competitors, there is now no significant difference between D. 14/34 and Co. 421. In addition, the advantage of planting over the entire bed which attained statistical significance in the plant crop is no longer present as ratoons. Indeed this treatment is now the least productive of the three. It is possible that this reduction in yield is to be correlated with the damage to stools in the centre of the bed which is almost certain to occur at reaping under a system of over-all planting.

TABLE XXI.—**Results of a Cultivation Trial on Flood-fallowed Frontland.**

Tons Cane per Acre.

Field 7 W., Sophia.

Treatments.	Plants.					1st Ratoons.				
	D. 14/34	D. 200/36	Co. 421	Mean Yields for Cultivation.	Sig. Diff., 20 : 1:	D. 14/34	D. 200/36	Co. 421	Mean Yields for Cultivation.	Sig. Diff., 20 : 1:
C.W. System	25.58	32.96	30.79	29.78	3.57	31.97	43.60	32.83	36.13	Nil
" " with 6 long rows	30.80	36.99	35.56	34.45		36.10	36.97	32.66	35.24	
" " flat forking for Cycle	26.30	31.99	30.70	29.63		36.74	41.07	30.19	36.00	
Sig. Diff., 20: 1:		6.18					8.21			
Mean Yields for Variety.	27.56	33.95	32.35			34.94	40.55	31.89		
Sig. Diff., 20: 1:		3.57					4.74			

(E 10) *Field 71 La P., Ogle.*

This trial differs somewhat from the previous five. It is designed to test the effect upon yield of varying the interval between cane rows and the amount of tops sown in the row. Three spacings are used in combination with three rates of sowing of tops—30 tops/row (single row), 45 tops/row (diamond) and 60 tops/row (double row). The results of the plant crop show that the practice occasionally followed on estates of sowing a single row of tops at 6 ft. intervals has been significantly outyielded by all other treatments. This would seem to indicate that a heavier "seed rate" is beneficial—whether it be attained by increasing the number of rows per bed by closer spacing between rows or simply by increasing the number of tops in the row. The increment in yield for plants is quite large—over 10 tons cane/acre in some cases—and it will be most interesting to see whether this advantage is maintained in the ratoon crops.

TABLE XXII.—Results of a Cultivation Trial on Flood-fallowed Frontland.

Treatments.	Tons Cane per Acre. Field 71 La P., Ogle. Plants, D. 14/34. A 30 Tops in Row.	B 45 Tops in Row.	C 60 Tops in Row.	Mean Yields for Rows and Spacing.	Sig. Diff., 20:1:
6 Rows, 6 ft. spacing	39.34	45.84	46.86	44.01	
8 „ 4.5 „ „	49.15	47.48	47.42	48.02	2.97
12 „ 3.0 „ „	50.91	47.52	46.07	48.17	
Sig. Diff., 20:1:		5.17			
Mean Yields for No. of Tops	46.47	46.95	46.78		
Sig. Diff., 20:1:		Nil			

SUB-SECTION F.—DISCUSSION AND SUMMARY.

Consideration of the plant cane results of the trials in 5 L. Bath and 1 E. Sophia and the plant and ratoon results of 1 A.O.G. Port Mourant led Williams and Cameron to the conclusion that "the standard 37 ft. beds with cross rows can be improved upon", and that there was no disadvantage attendant upon the use of long parallel rows provided adequate drainage could be secured. It is felt that these conclusions hold good for the ratoon results of these trials and that the result of the Skeldon experiment is not at variance with them. The initial result of investigations into the optimum spacing and planting rate suggest that some improvements in the yield of plant canes at any rate can be expected by the use of closer spacing and a heavier rate of tops/acre than is normally the practice.

THE VARIETY AND FERTILIZER POSITION OF THE SUGAR INDUSTRY, XII.

BY

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VARIETAL COMPOSITION OF THE 1947 HARVESTS.

Table I is compiled from returns kindly supplied by the sugar estates and records the percentage distribution of the cane varieties grown under estate conditions which will be reaped in 1947. Estate grown canes constitute 98% of the Colony's crop.

TABLE I.—**Percentage Distribution of the Varieties to be Reaped in 1947.**

Variety.	Total English Acres in the Colony.		Percentage. in West Demerara.	along Demerara River Banks.	in East Demerara.	in Berbice.
P.O.J. 2878	17,432.94	(27.6)	13.5	4.7	31.3	50.5
Diamond 10	13,644.73	(21.6)	9.1	68.3	11.0	11.6
Co. 421	12,265.26	(19.4)	14.9	12.7	21.4	51.0
D. 14/34	4,914.35	(7.8)	17.8	8.7	31.5	42.0
Co. 419	4,832.76	(7.7)	41.1	6.4	11.3	41.2
B. 34104	4,775.81	(7.6)	18.1	13.7	21.8	46.4
D. 14/33	2,199.56	(3.5)	14.9	0.9	30.4	53.8
D. 200/36	967.20	(1.5)	34.2	12.6	29.9	23.3
D. 166/34	633.88	(1.0)	2.2	16.3	21.8	59.7
Other Canes	1,456.83	(2.3)	0.3	68.9	8.4	22.4
	63,123.32	(100.0%)				

Table II shows the proportions in which the varieties which go to make up the small acreage of "other canes" occur. Table III indicates the trend in varietal planting over the last 8 years.

Consideration of the data summarized in the three tables shows :

(1) The increasingly rapid rate of change over from the two old standard varieties—P.O.J. 2878 and Diamond 10. Together these occupied 65.8% of the total acreage in 1946 whilst in 1947 they

occupy only 49.2%. The decline of P.O.J. 2878 has been the more pronounced of the two and has occurred throughout the colony. The acreage under Diamond 10 has been reduced appreciably in Berbice and West Demerara, but it is still holding its own along the Demerara River Banks.

(2) The shift from the two established varieties is accompanied by an increasing acreage of no less than 6 other varieties. In this respect it differs considerably from the major variety changes which have taken place in the past in which it was usual to find the favourite cane of its day being ousted by one or at most two new outstanding canes (Thus D. 625 gave place to Diamond 10 and P.O.J. 2878). In 1947 by contrast, we find steadily increasing acreages of Co. 421, D. 14/34, Co. 419, B. 34104, D. 14/33 and D. 200/36. Of these B. 34104 has made the most marked advance with Co. 421 also showing a very pronounced gain. The seedlings D. 14/34 and D. 14/33 have together increased their acreage from 6.4% in 1946 to 11.3% in 1947, while Co. 419 shows a steady advance being most popular in West Demerara. It is clear that as the general standard of varieties goes up, it will become increasingly difficult for one to be produced which is superior to the existing standards under *all* conditions, and it seems apparent that we are approaching the stage in British Guiana where it will become necessary to select for different ecological zones and possibly for different cultivation treatments. It is of interest to note how closely the commercial extension of these varieties bear out the Station's recommendations. Thus in 1944 Williams *(Sugar Bulletin No. 12)* advised the extension of the varieties D. 14/33, D. 14/34 and Co. 421 which he describes as "particularly striking," lists Co. 419 among varieties which had outyielded the standard and should be further tested and says of D. 200/36 and B. 34104 that they should be established and extended in estate nurseries "without delay."

TABLE II.—Acreages of the Varieties Constituting "Other Canes."

Variety.	English Acres.		Variety.	English Acres.		Variety.	English Acres.	
	1946	1947		1946	1947		1946	1947
D. 49/30	212	163	D. 201/36	—	119	Diamond 201	183	208
D. 66/30	133	109	D. 25/38	31	109	Co. 213	31	19
D. 419/33	190	153	D. 21/40	1	4	S.C. 12/4	498	301
D. 456/33	11	10						

TABLE III.—Comparison of Areas Under Various Canes in British Guiana, 1940-1947.

Variety.	Per Cent. of Total Area in the Colony.							
	1940	1941	1942	1943	1944	1945	1946	1947
D. 625	2.8	0.6	—	—	—	—	—	—
"Mixed"	0.6	0.2	—	—	—	—	—	—
Diamond 10	37.1	31.1	28.1	26.5	25.5	26.7	25.4	21.6
P.O.J. 2878	57.6	66.0	68.8	68.0	65.1	54.8	40.4	27.6
D. 166/34	—	—	—	1.6	2.2	2.2	1.6	1.0
Co. 419	—	—	—	1.3	3.0	4.9	6.5	7.7
Co. 421	—	—	—	—	1.6	6.3	15.1	19.4
D. 14/34	—	—	—	—	—	1.7	4.2	7.8
D. 14/33	—	—	—	—	—	1.0	2.2	3.5
B. 34104	—	—	—	—	—	—	1.6	7.6
D. 200/36*	—	—	—	—	—	—	—	1.5
Other Canes	1.9	2.1	3.1	2.6	2.6	2.4	3.0	2.3

*Included previously under Other Canes.

CYCLE AGE OF THE CROPS.

Table IV shows that there is a continued improvement in the planting position. Although the proportion of plant canes is slightly less than in 1946, the total area under plants, first and second ratoons has increased appreciably at the expense of acreage under 3rd and 4th ratoons.

TABLE IV.—Cycle Age of the Crops, 1944-1947.

Category.	Percentage in				Category.	Percentage in			
	1944	1945	1946	1947		1944	1945	1946	1947
Plants	17.4	24.9	29.3	28.4	3rd Ratoons	20.7	22.3	18.2	11.8
1st Ratoons	24.4	17.2	23.6	27.0	4th Ratoons	6.3	9.1	10.1	7.0
2nd Ratoons	28.2	24.0	16.4	22.3	5th Ratoons	3.0	2.5	2.4	3.5

COMMERCIAL YIELDS.

Table V presents the weighted mean yields of the various canes reaped on the estates in 1946. Unless a variety has been reaped over a considerable acreage, undue importance should not be attached to its position in the table. The high places held by the varieties Co. 421, B.34104, D.11 33 and D.14 34 both as plants and as 1st and 2nd ratoons, are in general agreement with their performance in variety trials and the Station's recommendations concerning them.

FERTILIZERS IN 1946.

Table VI adapted from the Reports of the Comptroller of Customs shows the fertilizer imports for the past six years. More lime and limestone have been imported in 1946 than in 1945 and there has been a considerable increase in the amount of phosphatic manures reaching the colony.

Table VII presents statistics relative to the quantity and value of fertilizers used in British Guiana Sugar Estates for the three years—1944, 1945 and 1946. Data for this table has been kindly supplied by estate Managers.

TABLE V.—**Weighted Mean Commercial Yields under Estate Conditions, 1946.**

Variety.	Acres Harvested.	Crusher Juice		Fibre % Cane.	Tons 96° Sugar per Acre.*
		Pol. %	Purity.		
		Plant Canes.			
D. 49/30	89.8	15.85	86.87	12.95	3.81
D. 14/34	1,273.9	14.95	84.12	14.33	3.71
B. 34104	626.1	14.53	83.34	14.63	3.62
D. 14/33	520.3	15.57	85.07	12.91	3.58
Co. 419	1,152.9	14.05	82.06	13.41	3.51
P.O.J. 2878	2,777.0	12.80	80.00	12.88	3.46
Diamond 201	135.5	16.11	86.75	—	3.45
Co. 421	4,690.1	13.62	81.04	15.68	3.43
D. 166/34	29.1	15.29	85.95	15.34	3.38
Mixed	44.2	15.09	83.56	—	3.27
S.C. 12/4	123.7	—	—	—	3.14
D. 25/38	25.9	11.62	77.64	—	3.14
Diamond 10	3,858.4	14.35	82.99	14.78	3.09
D. 200/36	270.7	12.87	79.99	14.80	2.99
		First Ratoons.			
B. 34104	41.6	15.63	84.57	12.15	4.03
Co. 421	2,694.5	14.48	82.41	15.30	3.71
D. 14/33	387.8	15.08	84.04	14.59	3.66
Co. 419	1,306.9	14.89	83.14	14.27	3.64
D. 14/34	645.0	15.14	83.69	14.18	3.64
D. 49/30	14.6	16.12	86.67	14.70	3.43
Mixed	3.0	14.01	83.40	—	3.34
D. 166/34	228.3	15.53	84.48	13.70	3.30
P.O.J. 2878	3,468.6	14.45	83.57	13.82	3.17
D. 200/36	44.9	14.05	82.42	14.20	2.92
Diamond 201	37.3	15.68	86.11	11.44	2.91
Diamond 10	4,088.8	14.13	83.69	13.85	2.81
S.C. 12/4	109.2	—	—	13.20	2.56
		Second Ratoons.			
D. 200/36	6.5	—	—	—	3.53
D. 14/34	78.6	15.29	84.23	14.86	3.42
Diamond 201	16.5	—	—	—	3.27
Co. 421	473.6	14.67	82.77	15.58	3.25
Mixed	26.0	14.73	82.85	—	3.11
Co. 419	606.7	15.24	83.58	15.22	3.04
D. 166/34	262.0	13.97	83.46	13.74	2.97
D. 14/33	105.5	15.35	84.90	14.84	2.95
P.O.J. 2878	4,012.2	14.75	83.64	13.91	2.85
S.C. 12/4	217.0	—	—	12.50	2.83
B. 34104	2.5	16.93	87.20	—	2.79
Diamond 10	3,382.4	14.49	84.21	15.87	2.73
D. 49/30	97.5	16.67	88.39	12.94	2.50
D. 419/33	50.0	15.42	84.46	—	2.45

* Undue importance should not be attached to the order of merit when only a small acreage has been harvested.

TABLE V. (Contd.).—**Weighted Mean Commercial Yields under Estate Conditions, 1946.**

Variety.	Acres Harvested.	Crusher Juice		Fibre % Cane.	Tons 96° Sugar per Acre.*
		Pol. %	Purity.		
		Third Ratoons.			
Co. 421	170.0	14.53	81.01	14.93	3.42
D. 66/30	46.0	15.31	84.03	—	3.28
D. 419/33	96.0	15.98	86.07	16.62	3.24
Co. 419	593.2	14.98	83.56	14.21	3.19
D. 14/34	14.5	14.66	83.92	—	3.12
D. 14/33	9.2	15.23	85.88	15.37	2.92
Diamond 10	2,236.4	14.42	83.32	15.73	2.62
S.C. 12/4	19.7	—	—	11.60	2.58
Co. 213	11.0	12.37	78.80	—	2.55
D. 166/34	242.0	14.60	82.86	15.90	2.47
Diamond 201	3.8	17.19	87.10	13.90	2.46
P.O.J. 2878	6,695.6	15.14	84.31	15.49	2.41
Mixed	35.1	13.58	80.29	—	2.20
D. 330/33	20.0	13.96	81.72	—	1.87

* Undue importance should not be attached to the order of merit when only a small acreage has been harvested.

TABLE VI.—Fertilizers Imported into British Guiana in Recent Years.

Year.	Nitrogenous Fertilizers (almost entirely Ammonium Sulphate).			Manurial Lime and Limestone.			Other Fertilizers (mainly Superphosphate and Basic Slag with some Potassium Sulphate).			Total Imports.	
	Tons.	Value $	Value per Ton, $	Tons.	Value $	Value per Ton, $	Tons.	Value $	Value per Ton, $	Tons.	Value $
1941	8,315†	592,555†	71.26	9,012	70,934	7.87	203	6,893	33.96	17,530	670,382
1942	6,040†	553,161†	91.58	5,642	61,810	10.96	301*	15,454*	51.34	11,983	630,425
1943	2,051†	185,042†	90.22	1,015	14,787	14.57	22*	949*	43.14	3,088	200,778
1944	11,993†	879,468†	73.33	2,581	37,963	14.71	...	...	...	14,574	917,431
1945	10,938†	756,971†	69.21	2,916	51,185	17.55	180*	7,022*	39.01	14,034	815,178
1946	10,456	667,246	63.81	4,853	72,864	15.01	974*	30,911*	31.74	16,283	771,011
Mean	8,299	605,740	72.99	4,336	51,589	11.90	336	12,246	36.45	12,971	669,575
% of Mean Annual Imports:	63.98	90.47		33.43	7.70		2.59	1.83			

*Includes
1942: All Superphosphate of Lime.
1943: All Pulverized Rock Phosphate.
1945: All Superphosphate of Lime.
1946: Basic Slag, Superphosphate and Pulverised Rock Phosphate.

†Includes
1941: 5,000 tons of Cyanamide, valued at $381,873 or $ 76.37 per ton.
1942: 4,550 ,, ,, ,, ,, ,, $406,938 or $ 89.44 per ton.
,, : 1,306 ,, ,, Ammonium Chloride ,, ,, $134,426 or $102.93 per ton.
1943: 1,339 ,, ,, Cyanamide ,, ,, $112,709 or $ 84.17 per ton.
,, : 706 ,, ,, Ammonium Chloride ,, ,, $ 71.587 or $101.40 per ton.
,, : 5 ,, ,, ,, Nitrate ,, ,, $ 631 or $126.20 per ton.
,, : 1 ton ,, Potassium ,, ,, ,, $ 115 or $115.00 per ton.
1944: 2,738 tons ,, Cyanamide ,, ,, $216,974 or $ 79.25 per ton.
,, : 1,500 ,, ,, Ammonium Chloride ,, ,, $156,867 or $104.58 per ton.
,, : 41 ,, ,, ,, Nitrate ,, ,, $ 3,579 or $ 87.29 per ton.
,, : 2 ,, ,, Sodium ,, ,, ,, $ 139 or $ 69.50 per ton.
1945: 446 ,, ,, Cyanamide ,, ,, $ 39,972 or $ 89.62 per ton.
,, : 2 ,, ,, Sodium Nitrate ,, ,, $ 180 or $ 90.00 per ton.

TABLE VII.—Values and Quantities of Fertilizers Used on British Guiana Sugar Estates, 1944—1946.

Fertilizers.	Value, $			Per cent. of Total Value.			Per Ton, $			Quantity, Tons.			Per cent. of Total Quantity.		
	1944	1945	1946	1944	1945	1946	1944	1945	1946	1944	1945	1946	1944	1945	1946
Ammonium Sulphate	336,618.07	749,692.29	866,830.54	44.8	86.8	89.1	75.64	77.77	81.44	4,449.98	9,639.80	10,643.62	41.4	71.1	68.7
Calcium Cyanamide	197,589.77	29,570.98	2,374.94	26.3	3.4	0.2	94.97	90.52	105.32	2,080.63	326.68	22.55	19.4	2.4	0.1
Sodium Nitrate	...	653.76	...	...	0.1	...	...	100.58	...	...	6.50	...	...	0.1	...
Basic Slag	...	...	9,275.61	...	...	1.0	...	...	55.21	...	...	168.00	...	...	1.1
Superphosphate	3,012.60	12,010.57	12,798.01	0.4	1.4	1.3	63.83	62.26	59.97	47.20	192.90	213.40	0.4	1.4	1.4
Limestone	41,774.21	55,057.36	69,163.03	5.6	6.4	7.1	15.66	16.98	16.91	2,668.25	3,241.52	4,090.15	24.9	23.9	26.4
Potassium Sulphate	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rock Phosphate	...	...	12,957.73	...	...	1.3	...	...	35.61	...	...	363.89	...	...	2.3
Ammonium Chloride	170,916.49	16,219.01	...	22.7	1.9	...	115.58	111.55	...	1,478.75	145.40	...	13.8	1.1	...
Ammonium Nitrate	1,285.30	472.43	...	0.2	...	...	92.27	96.22	...	13.93	4.91	...	0.1	...	...
Miscellaneous	...	30.87	...	...	...	...	...	68.60	...	...	.45	...	...	...	...
TOTAL	751,196.44	863,707.27	973,399.86	100.0	100.0	100.0	...	...	...	10,738.74	13,558.16	15,501.61	100.0	100.0	100.0

REPORT ON THE SUGAR EXPERIMENT STATIONS FOR THE YEAR 1946.

STAFF.

C. H. B. WILLIAMS, M.A., A.I.C.T.A., Dip. Agr.	*Director of Agriculture (Actg.).*
W. H. C. KNOWLES, A.I.C.T.A., Dip. Agr.	*Sugar Agronomist.*
C. CAMERON	*Field Manager.*
E. PAYNE	*Field Assistant.*
C. A. BANNISTER	*Field Assistant.*
J. TALMA	*Field Assistant.*
H. B. SINGH	*Laboratory Assistant.*
C. A. V. SMITH	*Statistical Assistant.*

2. Mr. Williams was appointed to act as Director of Agriculture as from 29th April *vice* Professor J. S. Dash, retired.

3. Mr. Knowles was appointed Sugar Agronomist from 1st October.

4. Absences of the Staff from duty during the year were as follows:—

	Casual Leave.	*Sick Leave.*	*Vacation Leave.*
Mr. Cameron	1. viii.—2. ix.	29. i.—25. ii. and 18—27. iii.	—
Mr. Singh	9—21. ix.	3—6. vi.	—
Mr. Smith	16. x.—1. xi.	8—15. iv.	—
Mr. Bannister	—	15—18. x.	—
Mr. Payne	2—18. xii.	22. iii.—20. v.	—
Mr. Talma	—	21—30. iii.	—

COMMITTEE.

5. The following members formed the British Guiana Sugar Experiment Stations' Committee for the year:—

THE DIRECTOR OF AGRICULTURE, (Actg.)	*Chairman (to December).*
THE DIRECTOR OF AGRICULTURE	*Chairman (from December).*
MR. J. C. GIBSON	*Messrs. Booker Bros., McConnell & Co., Ltd.*
HON. M. B. G. AUSTIN, O.B.E.	*Messrs. Curtis, Campbell & Co., Ltd. (to March).*
MR. R. R. FOLLETT-SMITH	*Messrs. Booker Bros., McConnell & Co., Ltd. (from March).*
MR. G. M. ECCLES	*Messrs. S. Davson & Co., Ltd.*
MR. G. H. HOLDEN	*Messrs. Sandbach, Parker & Co., Ltd. (to March).*
MR. H. R. BARNWELL	*Messrs. Sandbach, Parker & Co., Ltd. (from April).*
MR. C. H. PALMER	*Messrs. Booker Bros., McConnell & Co., Ltd. (to July).*
MR. H. A. BARCLAY	*Messrs. Booker Bros., McConnell & Co., Ltd. (from August).*
MR. R. F. MILNE	*Messrs. Booker Bros., McConnell & Co., Ltd.*

Meetings were held on the 19th February, 15th April, 18th October and 23rd December, 1946. The Committee suffered the loss of one of its members by the death of Mr. C. H. Palmer in July.

FINANCE.

6. The sum of $27,396.00 was voted from the funds of the Sugar Experiment Stations' Committee for the working of the Station during the year; the total spent was $26,676.46 leaving an unexpended balance of $719.54.

7. Receipts from Assessments during the year amounted to $20,611.14, those from sale of canes to $8,776.95, and miscellaneous receipts to $220.03.

8. In addition to the amount spent from the funds of the Committee, $238.00 was expended from a special grant made for fertilizer research by the Chilean Nitrate Corporation. This sum, together with those spent in previous years, brings the total spent from this source, to date, to $3,572.14. This grant was closed at year end with a balance of $1.27.

EQUIPMENT.

9. Largely as a matter of economy no major repairs were effected during the year, save where the office, laboratory, mill and store-rooms were painted and the motor garage repaired. The bridge across the Lamaha Canal was dismantled owing to dredge operations by the Lamaha Conservancy.

CANE BREEDING AND INTRODUCTION.

10. Table I lists, under their year of production, the number of Demerara seedlings in field experiments and those under multiplication and selection.

TABLE I.—**Demerara Seedlings in Tests and Undergoing Multiplication, etc., December, 1946.**

Year.	Number of Seedlings.	
	In Test.	Under Multiplication, etc.
1933	1	—
1934	1	—
1936	1	—
1937	—	—
1938	4	—
1939	1	—
1940	4	—
1941	76	36
1942	1	4
1943	1	42
1944	—	32
1945	—	115*
Total	**90**	**229**

* Selection incomplete due to unfavourable weather conditions.

11. At the time of writing the 1946 seedlings are being transplanted to the field. Owing to post-war conditions and labour shortage, all the transplanting will be done to frontland clay at Sophia.

12. *The 1945 seedlings* have been subjected to their first selection and 115 have been extended on frontland clay at Sophia. As recorded in recent Annual Reports, labour shortages and frequent staff changes handicapped the 1945 breeding programme and in consequence, only 4,318 seedlings of this batch had been transplanted to the field.

TABLE II.—Crosses Attempted, Seedlings Selected, etc., 1945.

Combinations.	No. of Arrows used.	No. of Boxes Sown.	No. of Seedlings Basketed.	No. of Seedlings Planted in Field.	1st Selection.	
					No.	%.
I. Interspecific Crosses.						
1. 6th Nobilized Glagah:—						
D. 25/38 x Diamond 10	2	4	338	264	*	*
Total	2	4	338	264	*	*
2. Glagah, Chunnee and Noble Combinations :—						
B. 34104 x Co. 421	2	4	13	11	4	36.36
„ x Co. 331	4	4	20	20	7	35.00
„ x Diamond 10	13	13	257	198	34	17.17
„ x D. 114/36	2	1	3	3	1	33.33
„ x D. 200/36	7	4	29	22	1	4.55
„ x D. 25/38	2	2	5	5	1	20.00
„ x D. 43/38	2	2	47	41	7	17.07
„ x D. 17/39	2	4	39	38	7	18.42
„ x D. 11/40	2	2	3	3	1	33.33
Co. 421 x D. 200/36	4	4	740	549	17	3.10
D. 14/34 x „	3	5	401	264	26	9.85
„ x Diamond 10	3	5	23	22	2	9.09
D. 2/40 x „	3	3	100	77	2	2.60
Total	49	53	1,680	1,253	110	8.78
2. Glagah, Chunnee and Noble Combinations (Contd.) :—						
B. 34104 x Co. 419	1	1	—	—		
„ x D. 14/33	2	2	16	11		
„ x D. 9/40	2	2	17	15		
Co. 421 x Co. 213	4	5	446	329		
Co. 281 x Diamond 10	2	2	27	22		
„ x D 200/36	2	4	842	704		
D. 2/40 x Co. 331	4	7	161	77	*	*
D. 43/38 x „	1	2	264	110		
D. 71/41 x „	4	8	203	121		
Co. 421 x „	7	7	1,213	904		
D. 14/34 x „	3	3	351	220		
D. 71/41 x Diamond 10	3	6	104	93		
Total	35	49	3,644	2,606	*	*

TABLE II. (Contd.).—Crosses Attempted, Seedlings Selected, etc., 1945.

Combinations.	No. of Arrows used.	No. of Boxes Sown.	No. of Seedlings Basketed.	No. of Seedlings Planted in Field.	1st Selection.	
					No.	%.
3. Noble Combination :—						
B. 3439 x Diamond 10	3	6	20	11	1	9.09
Total	3	6	20	11	1	9.09
4. 4th Nobilized Saccharum Barberi :—						
B. 37161 x Diamond 10	3	6	25	19	4	21.05
Total	3	6	25	19	4	21.05
5. Other Combinations :—						
Co. 421 x D. 166/34	5	3	336	165	*	*
Total	5	3	336	165	*	*
Grand Total	97	121	6,043	4,318	115	8.96

* Selection incomplete due to unfavourable weather conditions.

13. Cane varieties imported during the year through the Central Plant Quarantine Station, I.C.T.A., Trinidad, B.W.I., were as follows:—

B. 4098, B. 4306, B. 4327, B. 4362, B. 4373, B. 4381, B. 43214, B. 43218, B. 43229, B. 43234, B. 43235, B. 43253, B. 43254, B. 43255, B. 43330, B. 43337, B. 43346, B. 43349, B. 43388, B. 43391, B. 43398, B. 43403, B. 43413 and M. 275.

EXPERIMENTS.

14. In Sugar Bulletin No. 15 the experiments reaped during the year have been fully reported and they will not be discussed here. At the end of the year there were 50 variety, 14 manurial, and 22 cultivation experiments in progress. Considerable attention was devoted to microplot fertilizer tests with maize, mention of which appears in Table III.

MISCELLANEOUS.

15. Table III gives statistics, for recent years, as to seedlings bred, field experiments started and reaped, cane cuttings distributed, cane samples analysed, etc.

16. No Field Days were held during 1946.

17. Six cuttings each of D. 14/34 and D. 200/36 were shipped to the Central Quarantine Station, I.C.T.A., Trinidad, B.W.I.

18. Cane Fluff from eight Demerara crosses were shipped to the Sugar Technologist, Cairo, Egypt. They were as follows:—

Co. 419 x Diamond 10	;	D. 200/36 x Co. 421
D. 14/34 x „	;	Co. 421 x D. 200/36
Co. 331 x „	;	Diamond 10 x Co. 331
B. 34104 x „	;	D. 49/41 x D. 200/36

TABLE III.—**Statistics of Seedlings, Cane Distribution, Field Experiments, Cane and Soil Samples, Canes Sold and Visits Paid to Estates, 1937-1946.**

Year.	Seedlings basketed.	Cane Cuttings Distributed.		Field Experiments.		Cane Samples.		Soil Samples taken.	Cane Sold to Pln. Ogle.		No. of Days visiting Estates.
		No. of Cuttings.	No. of Bags.	Started.	Harvested.	No. taken and analysed.	Cane crushed (Tons).		Deliveries (Tons).	Net Receipts, $	
1937	23,421	333,222	2,563	28	104	4,192	46	336	1,714.70	3,374.39	237
1938	12,151	221,780	1,706	17	104	3,263	34	38	1,697.05	3,219.35	174
1939	9,714	372,320	2,864	29	76	1,797	21	208	1,326.95	2,818.25	184
1940	19,557	430,950	3,315	41	56	559	14	42	1,114.40	2,657.55	216
1941	21,354	637,780	4,906	30	62	626	7	18	1,077.50	2,713.32	230
1942	6,007	881,660	6,782	28	74	909	21	9	1,476.70	3,718.98	212
1943	8,951	524,810	4,037	19	78	819	16	159	1,352.85	3,525.65	211
1944	12,903	602,420	4,634	11	72	434	14	31	1,590.09	5,053.26	139
1945	6,043	578,240	4,448	98*	118†	605	14	95	1,461.02	6,812.25	173
1946	3,896	477,230	3,671	55*	111†	505	15	51	1,750.20	8,776.95	177

1945 { * Includes 64 Maize Micro-plot Experiments.
† Includes 53 „ „ „ „

1946 { * Includes 30 Maize Micro-plot Experiments.
† Includes 39 „ „ „ „

19. The British West Indies Conference of Sugar Technologists was held at Georgetown in October, and members paid visits to Sophia and some of the sugar estates of the colony.

RAINFALL.

20. Table IV compares the 1946 monthly rainfall at the Sugar Experiment Station with the monthly averages for 1921—1946.

TABLE IV.—**Comparison of the Rainfall at Sophia for the year 1946, with the Average for 1921-1946.**

Month.	Actual Rainfall, 1946. Inches.	Average Rainfall, 1921—1946, Inches.	Excess or Deficit, Inches.
January 1946	4.53	8.60	— 4.07
February „	5.71	4.66	1.05
March „	1.31	4.55	— 3.24
April „	10.11	6.34	3.77
May „	15.02	11.99	3.03
June „	9.84	14.71	— 4.87
July „	17.73	11.63	6.10
August „	5.00	7.64	— 2.64
September „	1.37	2.58	— 1.21
October „	1.86	3.84	— 1.98
November „	5.53	5.69	— 0.16
December „	3.35	14.23	—10.88
Total	81.36	96.46	—15.10

ACKNOWLEDGEMENTS.

21. The cordial co-operation of the Staff of the Sugar Estates and of the Sugar Experiment Station is very gratefully acknowledged.

W. H. C. KNOWLES,
Sugar Agronomist.

1947.